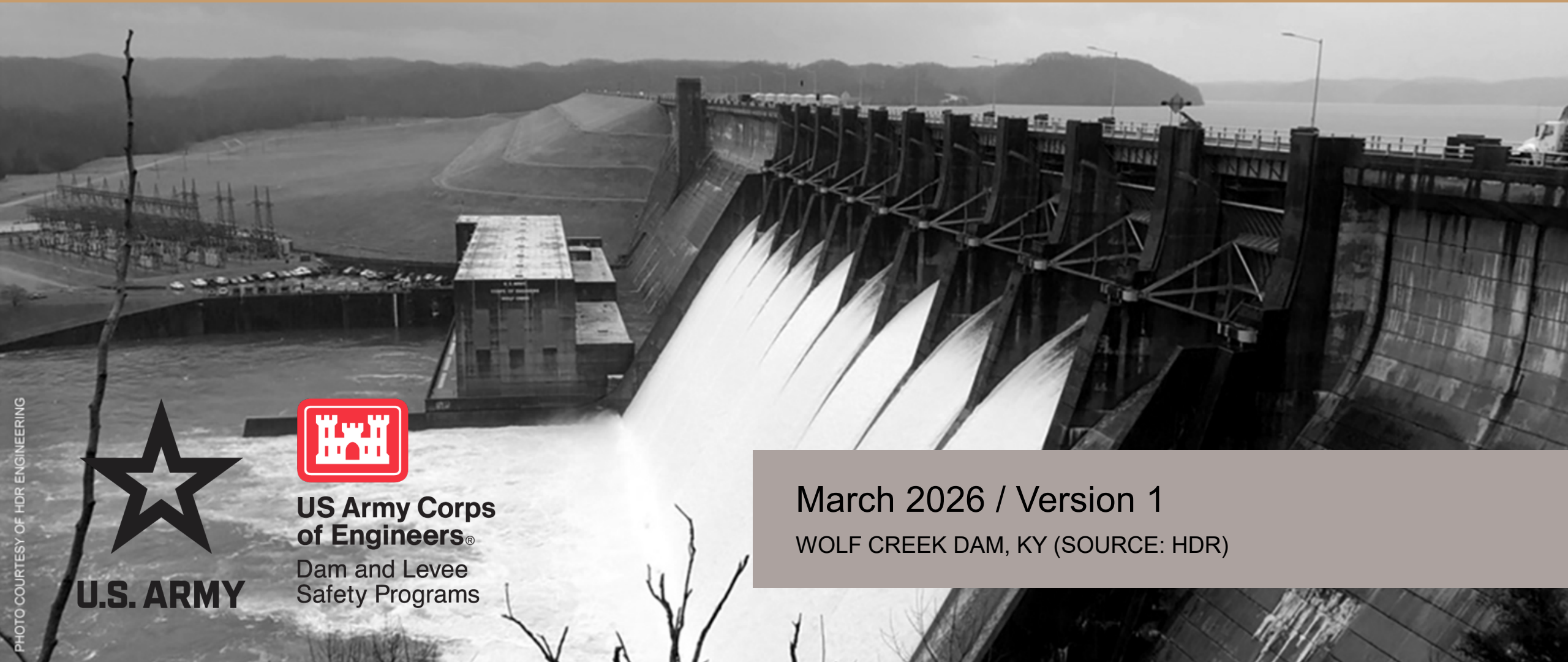


BestFit Exercise Overview

DLS-114, Module 1.22



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. Calculate a flow frequency curve with regional skew information
2. Calculate a flow frequency curve with precipitation frequency information

Additional Tasks

3. Explore RMC-BestFit diagnostic tools
4. Compare flow frequency curves using one versus three quantile priors

Task 1

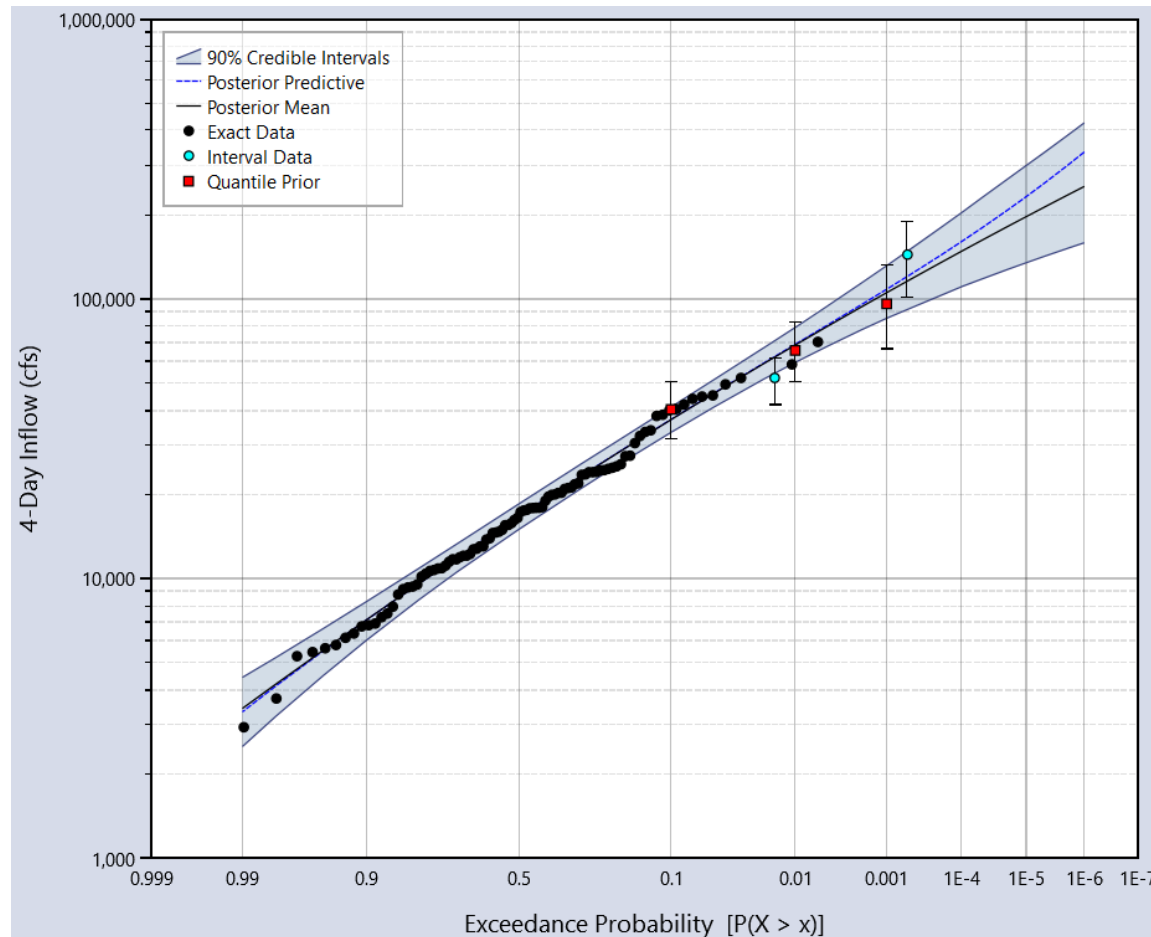
Calculate a Flow Frequency Curve with Regional Skew Information

| Flood region (fig. 1) | Statistic | GIS-derived drainage area (mi ²) | SLPFM (ft/mi) | BSHAPE | ELEV (ft) | PRECIP (in.) | SOILINDEX | LC11DVOPN (percent) | LC11PAST (percent) | UPZ (percent) | ALVM (percent) |
|-----------------------|-----------|--|---------------|--------|-----------|--------------|-----------|---------------------|--------------------|---------------|----------------|
| A | minimum | 0.04 | -- | -- | 380.51 | -- | -- | -- | -- | -- | -- |
| | maximum | 1,250 | -- | -- | 1,832.27 | -- | -- | -- | -- | -- | -- |
| B subregion 1 | minimum | 0.10 | -- | 2.94 | 493.94 | -- | -- | -- | -- | -- | -- |
| | maximum | 2,680 | -- | 15.06 | 1,527.44 | -- | -- | -- | -- | -- | -- |
| B subregion 2 | minimum | 0.04 | -- | -- | 168.88 | 49.36 | 2.2 | 0 | -- | -- | 0 |
| | maximum | 2,090 | -- | -- | 500.55 | 56.55 | 3.8 | 10.89 | -- | -- | 100 |
| C | minimum | 0.09 | -- | 1.97 | -- | -- | -- | -- | 0 | 0 | -- |
| | maximum | 2,050 | -- | 15.09 | -- | -- | -- | -- | 87.51 | 100 | -- |
| D | minimum | 0.15 | 0.36 | 3.12 | -- | -- | -- | -- | -- | -- | -- |
| | maximum | 1,620 | 31.74 | 75.97 | -- | -- | -- | -- | -- | -- | -- |

The CONSTANT model, -0.17, is chosen as the best regional skewness model for the Arkansas-Louisiana study area. A constant model does not explain any variability in the true skews, so the pseudo- R^2_δ equals 0. The posterior mean of the model error variance, σ_δ^2 , for the CONSTANT model is $\sigma_\delta^2 = 0.11$. The average sampling error variance (ASEV) in table 1-2 is the average error in the regional skewness estimator at the sites in the dataset. The average variance of prediction at a new site (AVP_{new}) corresponds to the MSE used in Bulletin 17B to describe the precision of the generalized skewness. The CONSTANT model has an AVP_{new} , equal to 0.12, which corresponds to an effective record length of 59 years.

Task 2

Calculate a Flow Frequency Curve with Precipitation Frequency Information



Using three quantile prior with AEP of 0.1, 0.01, 0.001

Mean:

Standard Deviation:

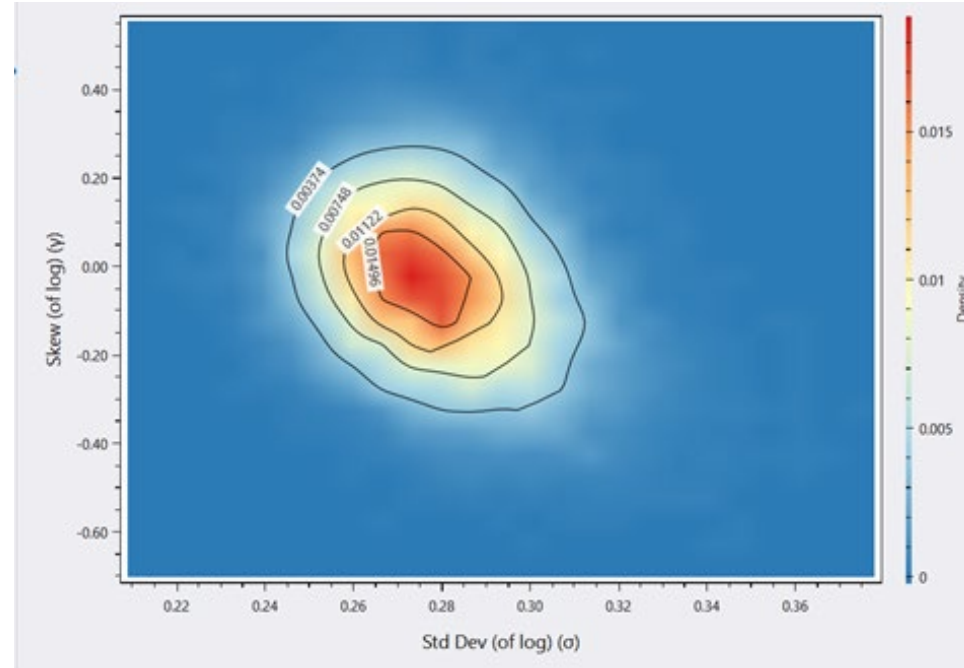
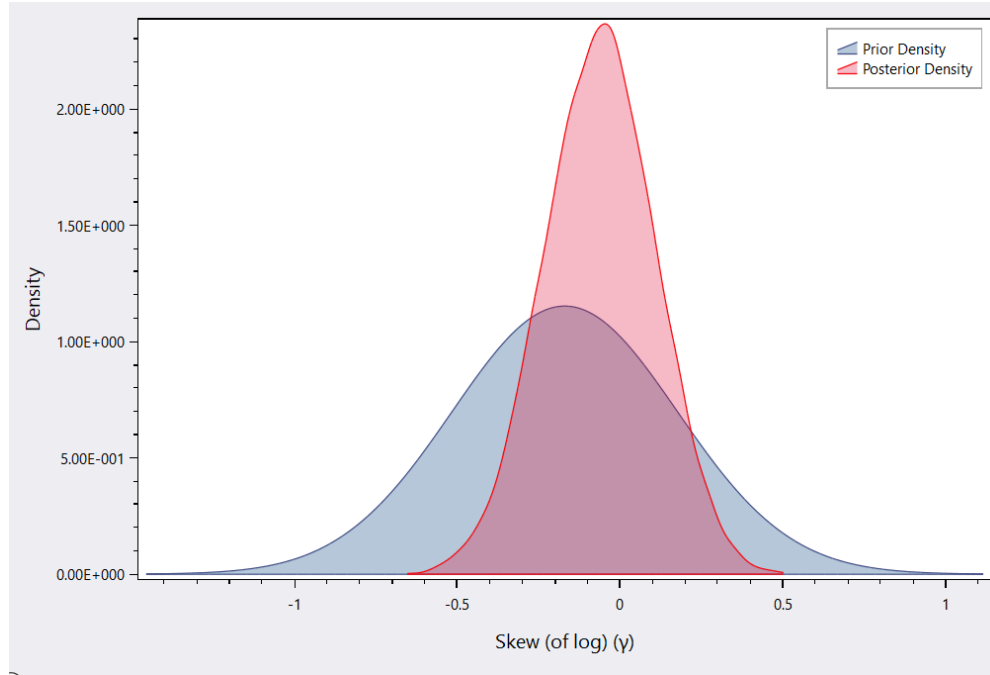
Skew:

Additional Tasks



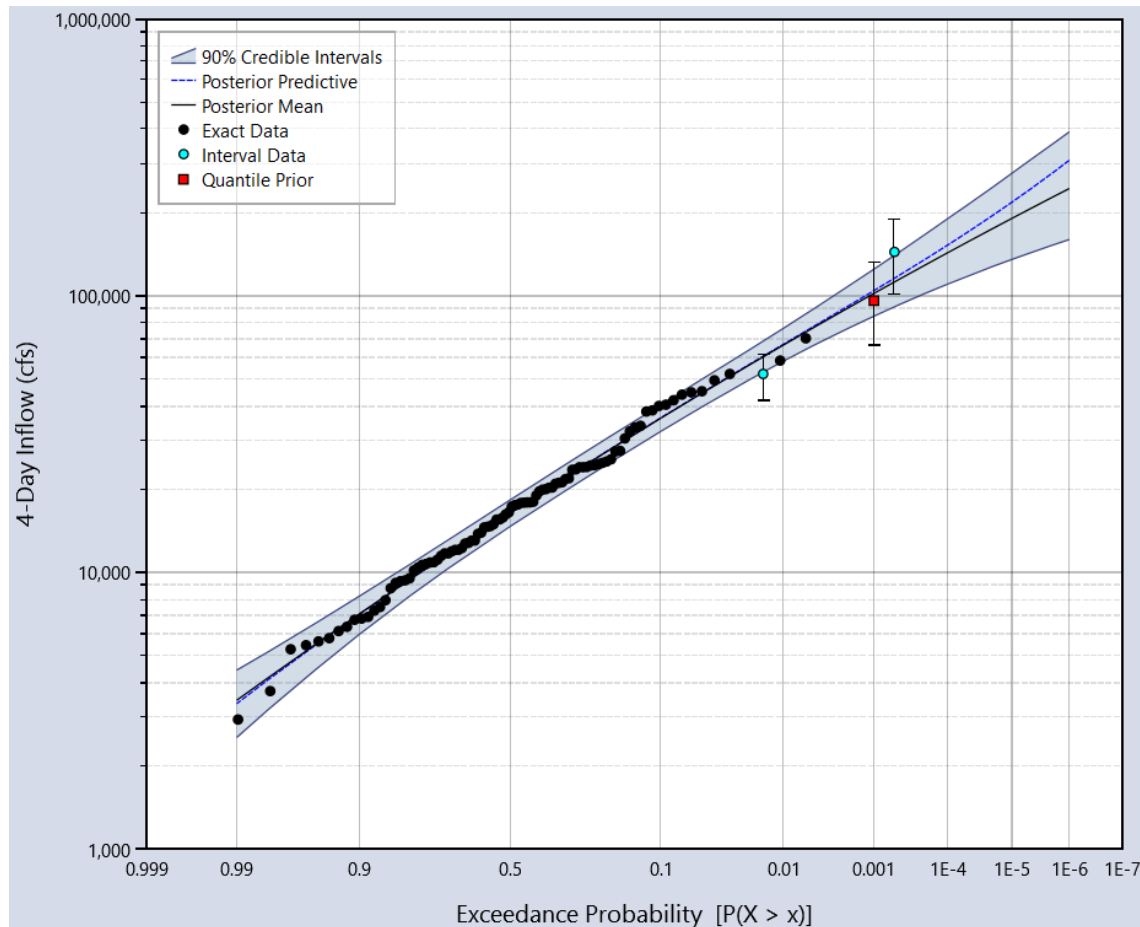
Task 3

Explore RMC-BestFit Diagnostic Tools



Task 4

Compare Frequency Curves Using One versus Three Quantile Priors



Using one quantile
priors 0.001 AEP

Mean:

Standard Deviation:

Skew:

? Questions

