

# Interval Data

## DLS-114, Module 1.8



**U.S. ARMY**



**US Army Corps  
of Engineers®**

Dam and Levee  
Safety Programs

March 2026 / Version 1

COUGAR DAM, OR (SOURCE: HDR)

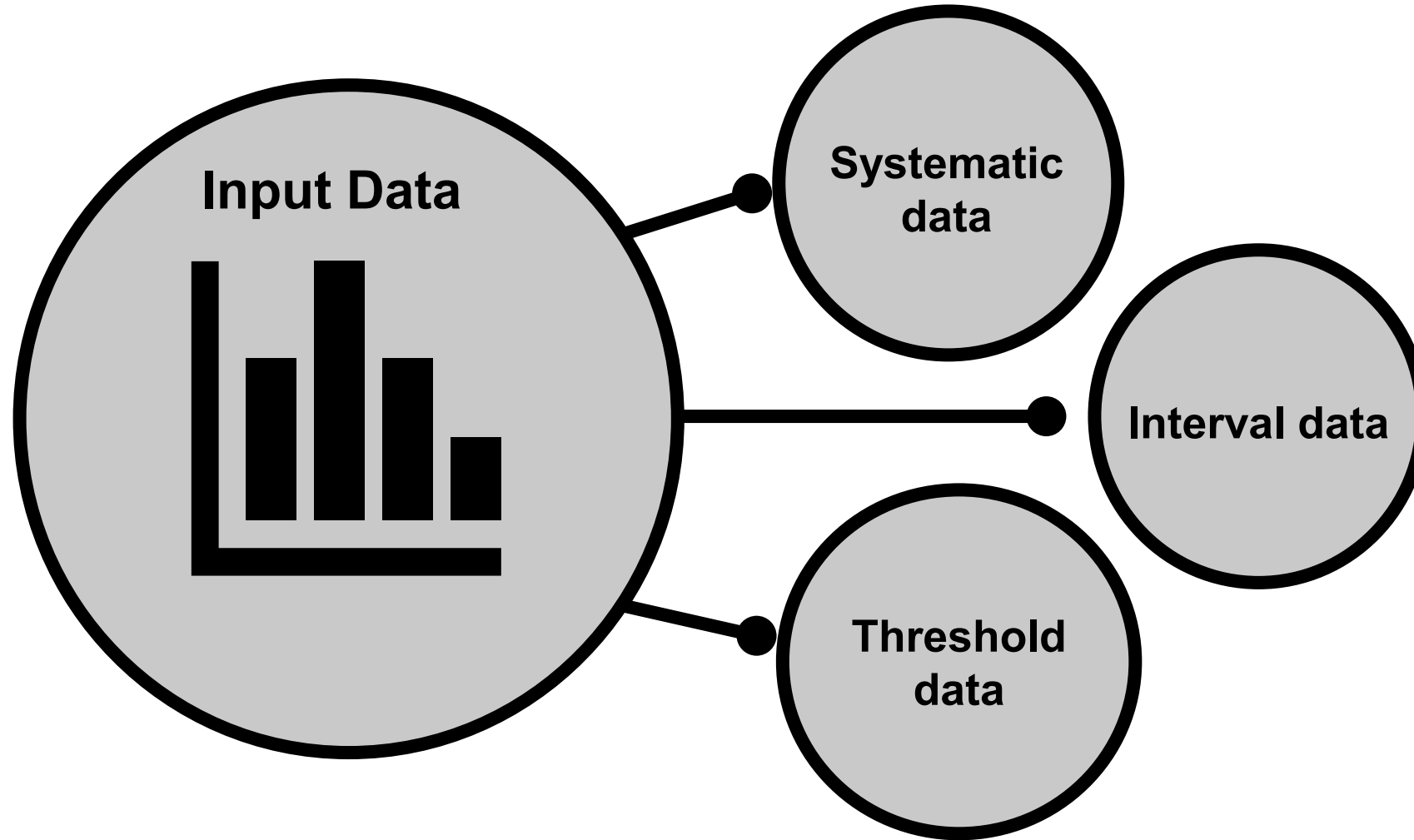
# Learning Objectives

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- Locate historical data
- Demonstrate how to enter interval data into RMC-BestFit

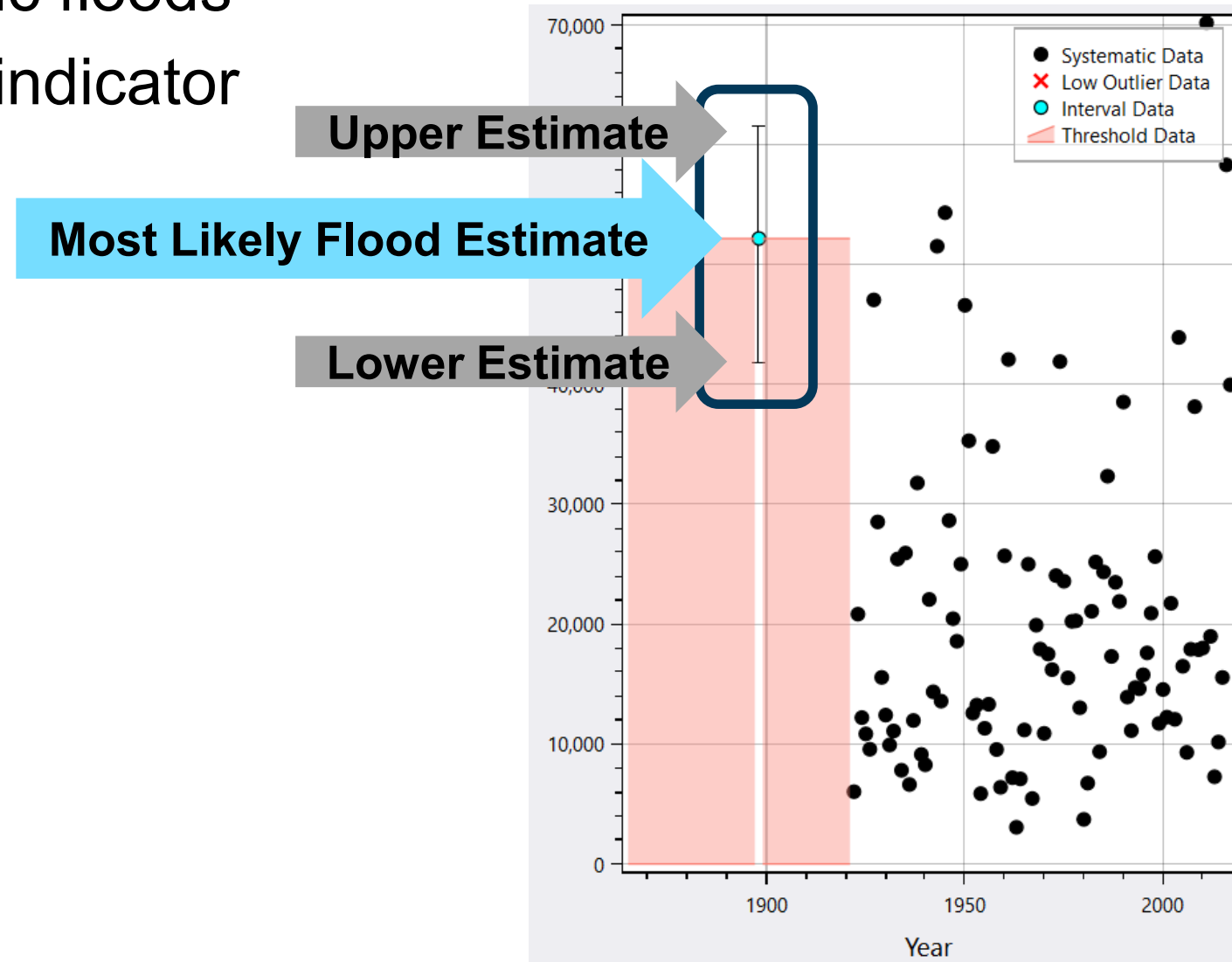
# Input Data

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# Flood Intervals Defined

- Large historic floods
- Paleostage indicator (PSI)

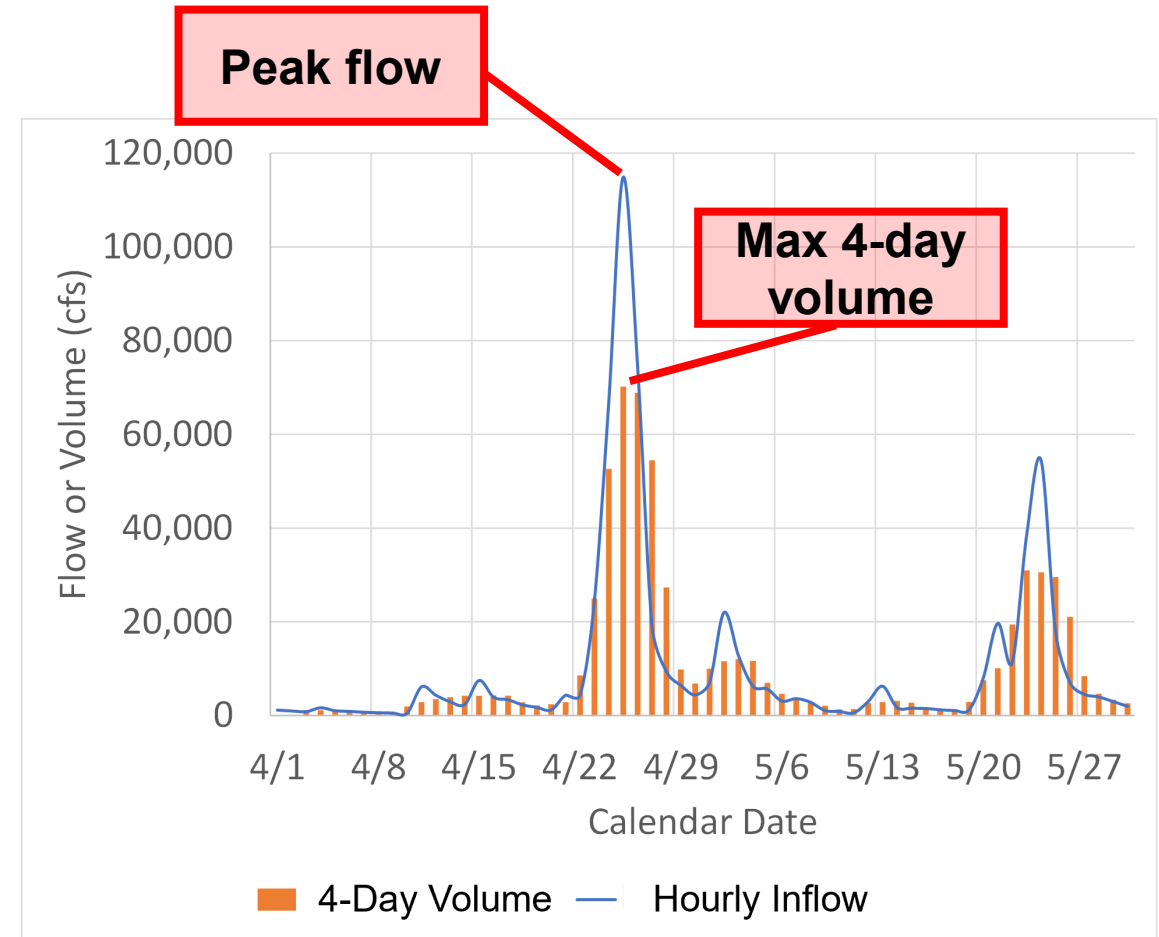


# Critical Duration & Peak to Volume Ratio

- Have peak discharge
- Need critical duration volume
- Ratio derived from observed hydrographs

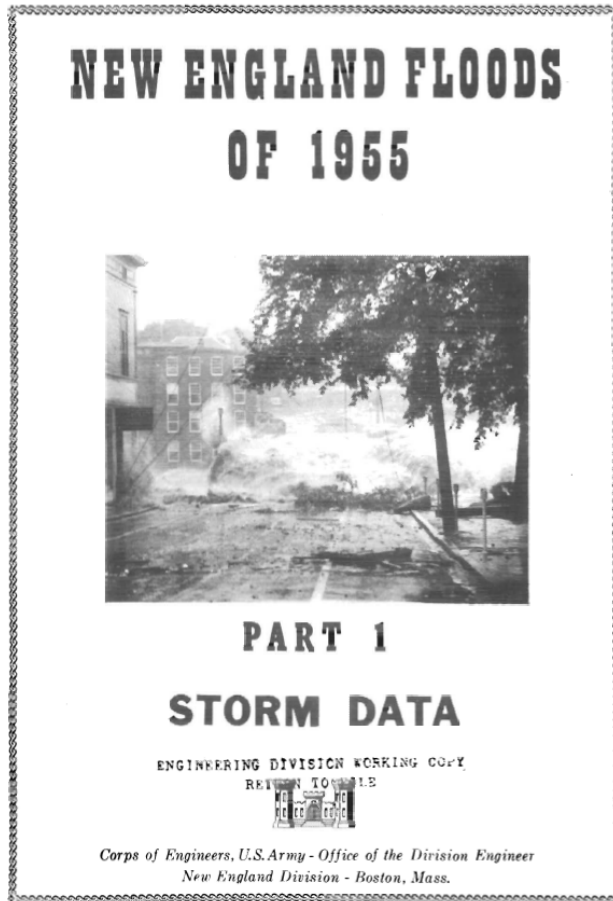
## Peak to volume ratio

$$\frac{117,000 \text{ cfs}}{70,000 \text{ cfs}} = 1.67$$



# Where to Look for Historical Data

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- USACE Water Control Manuals
- USACE CWMS database
- USACE Definite Project Reports (DPRs), Design Memoranda (DMs), or other design reports
- USACE District Flood Reports
- USGS Instantaneous Data Archive
- USGS Water-Supply Papers
- Bulletin 17C
- Newspapers
- Libraries

# USACE Water Control Manuals

## June 1972 Hurricane Agnes flood, Foster Joseph Sayers Dam, PA

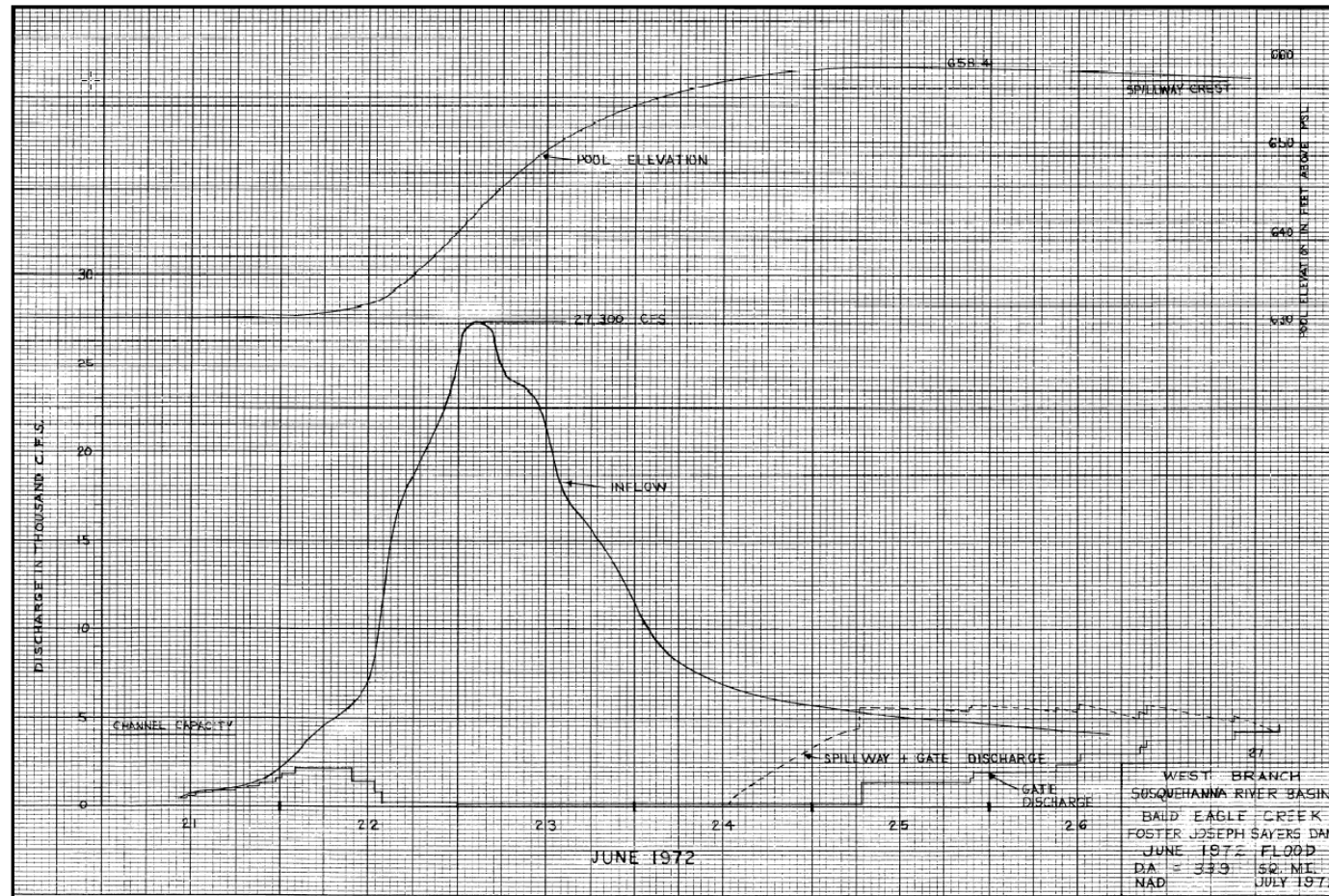
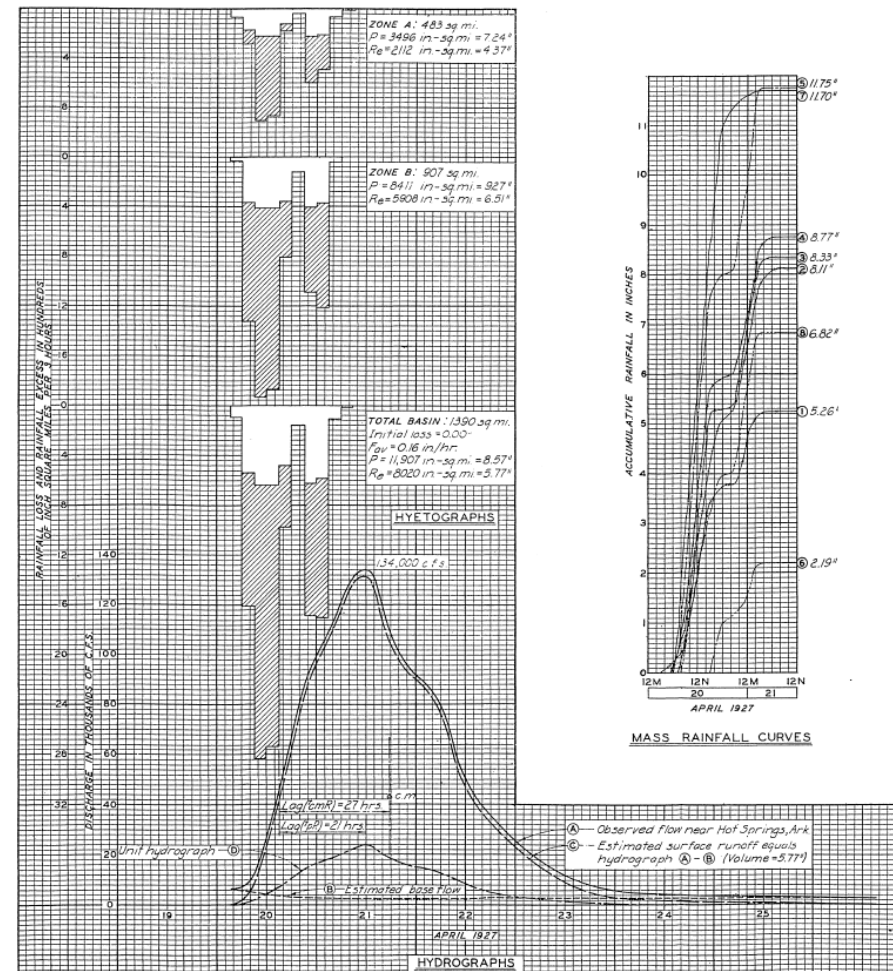
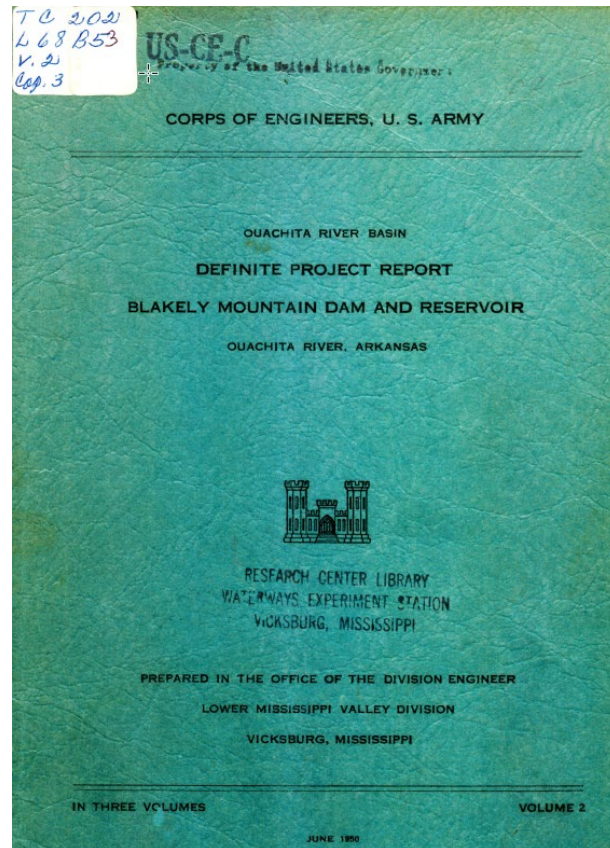


Figure 6 - Example of Flood Routing Plate from a Water Control Manual

# USACE Definite Project Reports (DPR)

April 20-21, 1927 flood; Ouachita River near Blakely Mountain Dam, AR



# USACE Design Memorandum Reports (DM)

Natural hydrographs for UH derivations; Middle Fork Willamette River at Hills Creek Dam, OR;

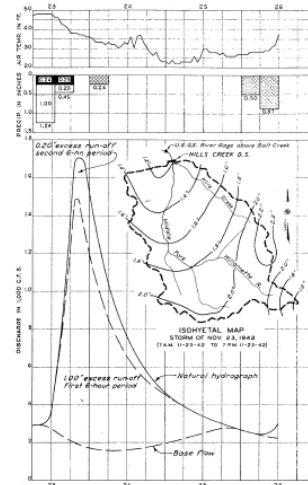
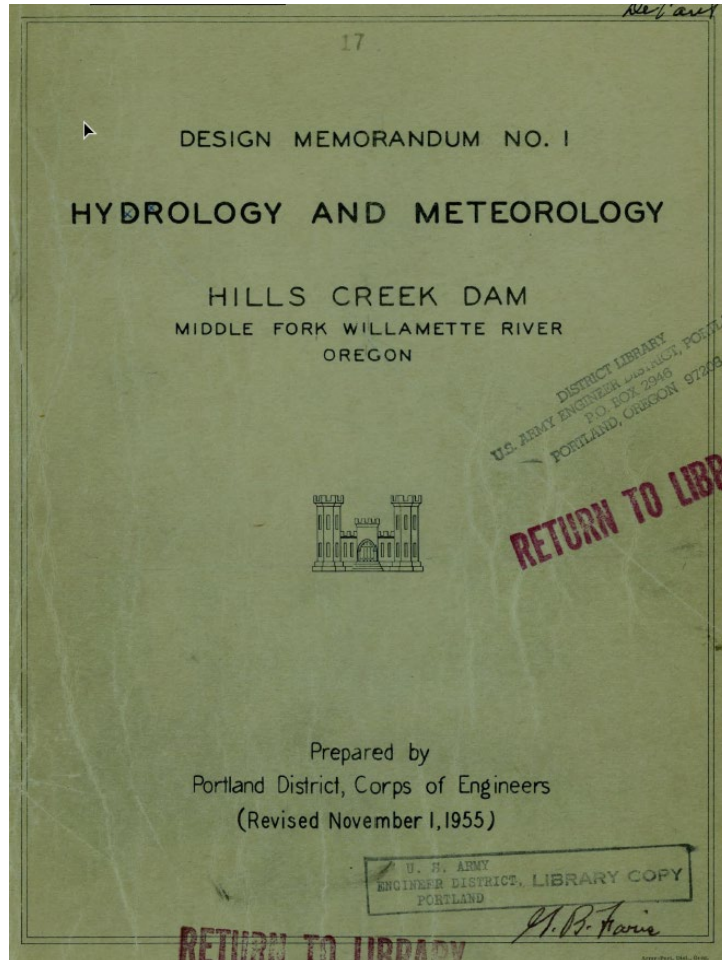


FIG. 3 - STORM OF NOV. 23, 1942  
6-HOUR INCREMENTS OF PRECIPITATION RUN-OFF

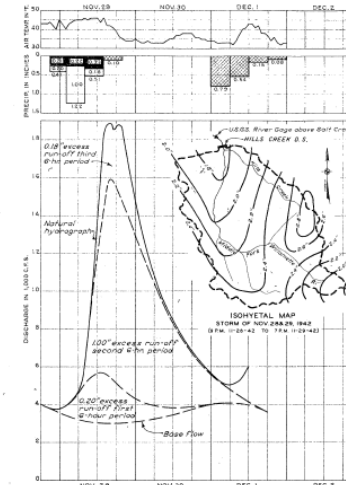


FIG. 2 - STORM OF NOV. 28 & 29, 1942  
6-HOUR INCREMENTS OF PRECIPITATION RUN-OFF

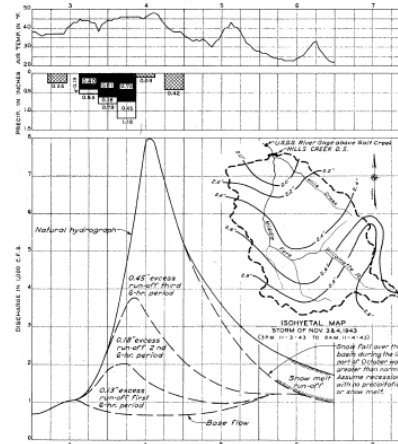


FIG. 4 - STORM OF NOV. 3 & 4, 1943  
6-HOUR INCREMENTS OF PRECIPITATION RUN-OFF

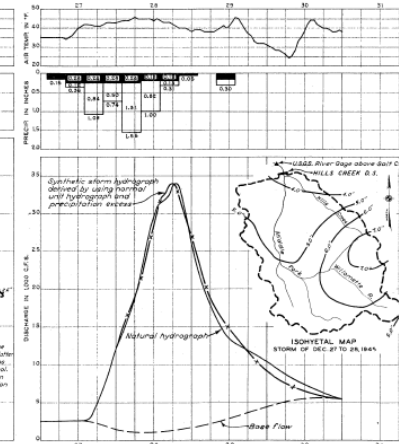
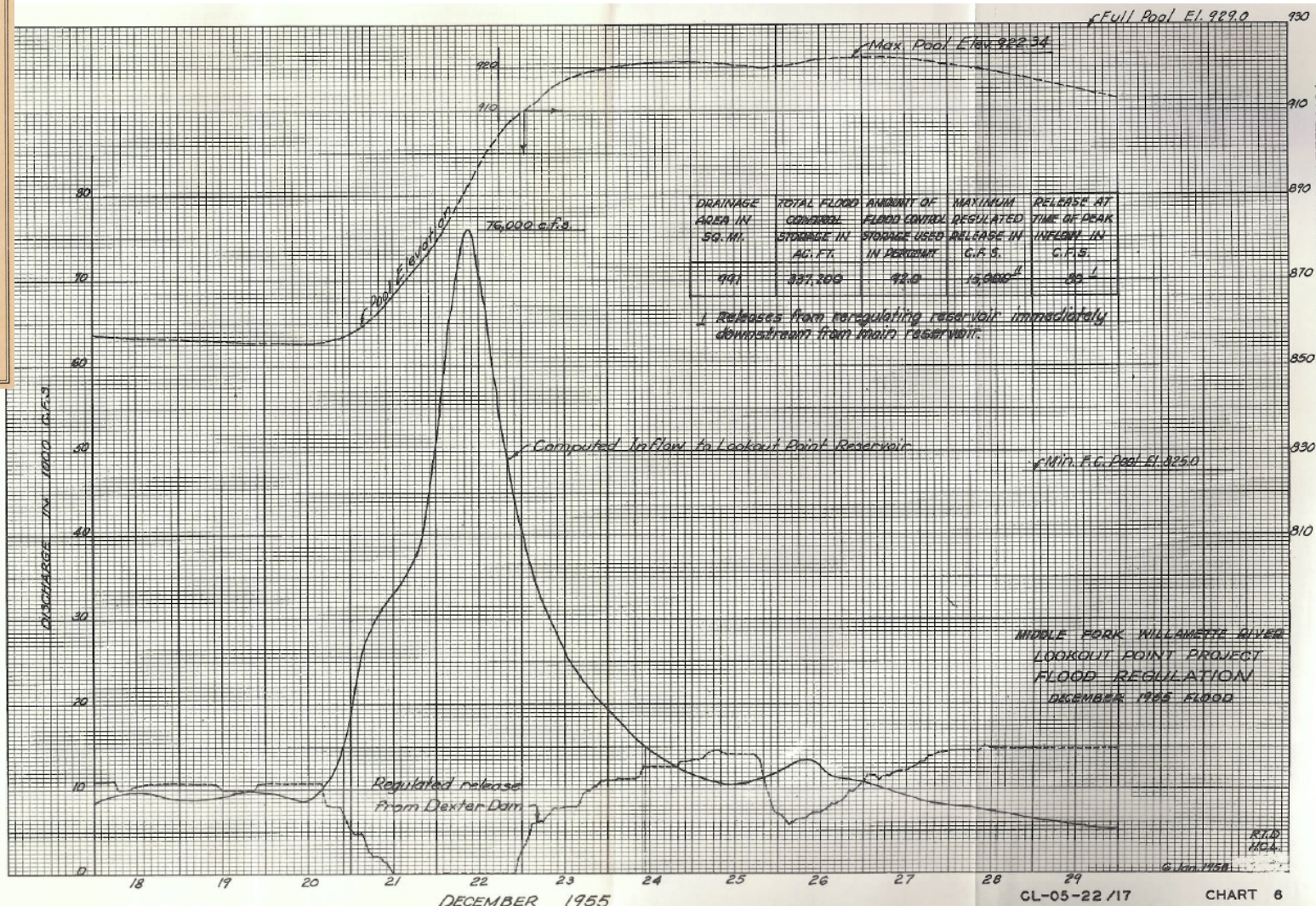
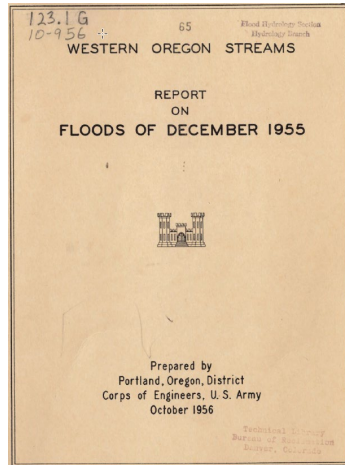


FIG. 5 - STORM OF DEC. 27 TO 28, 1945  
VERIFICATION OF UNIT HYDROGRAPH

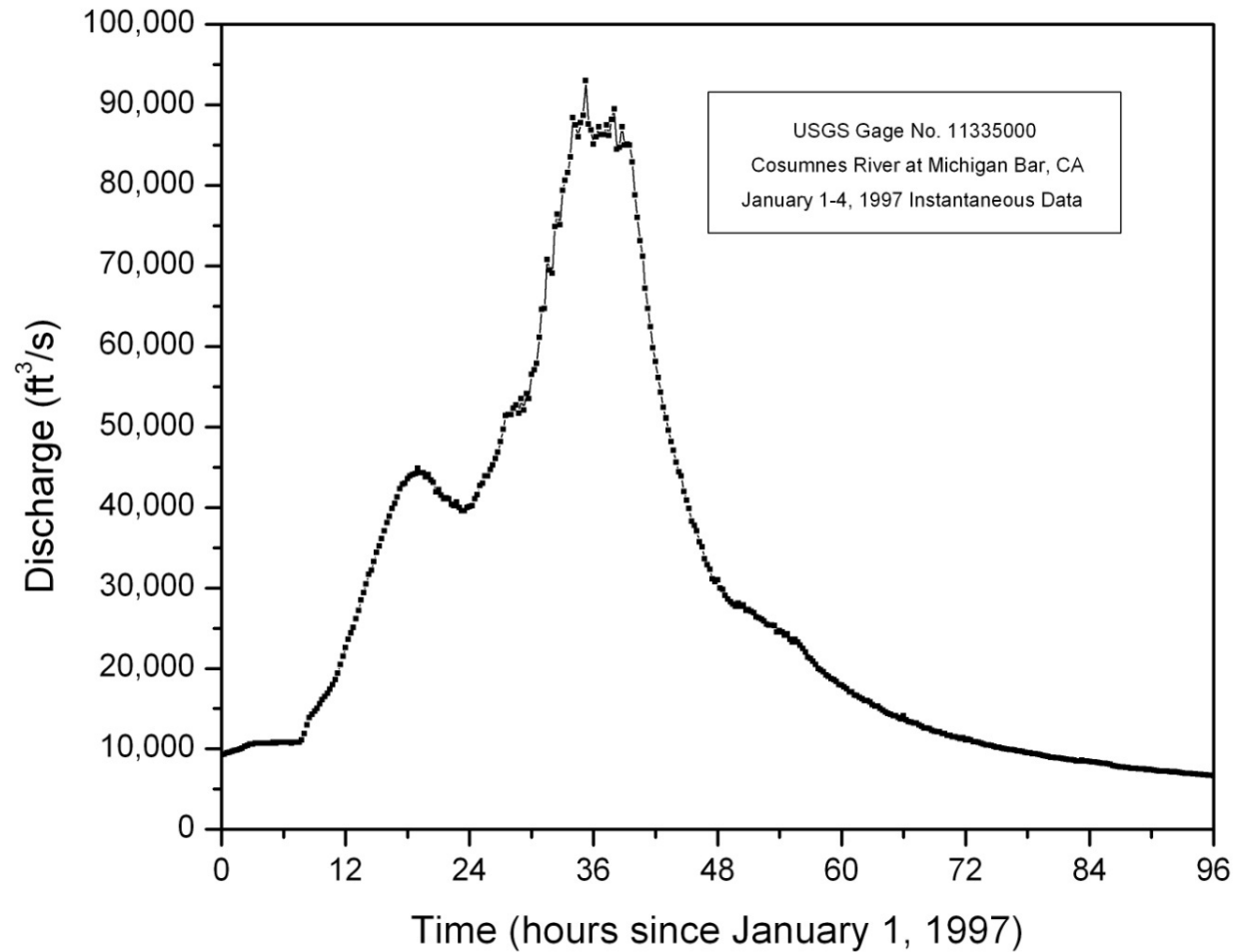


# USACE District Flood Reports

## Report on Floods of December 1955, Western Oregon Streams, Portland District



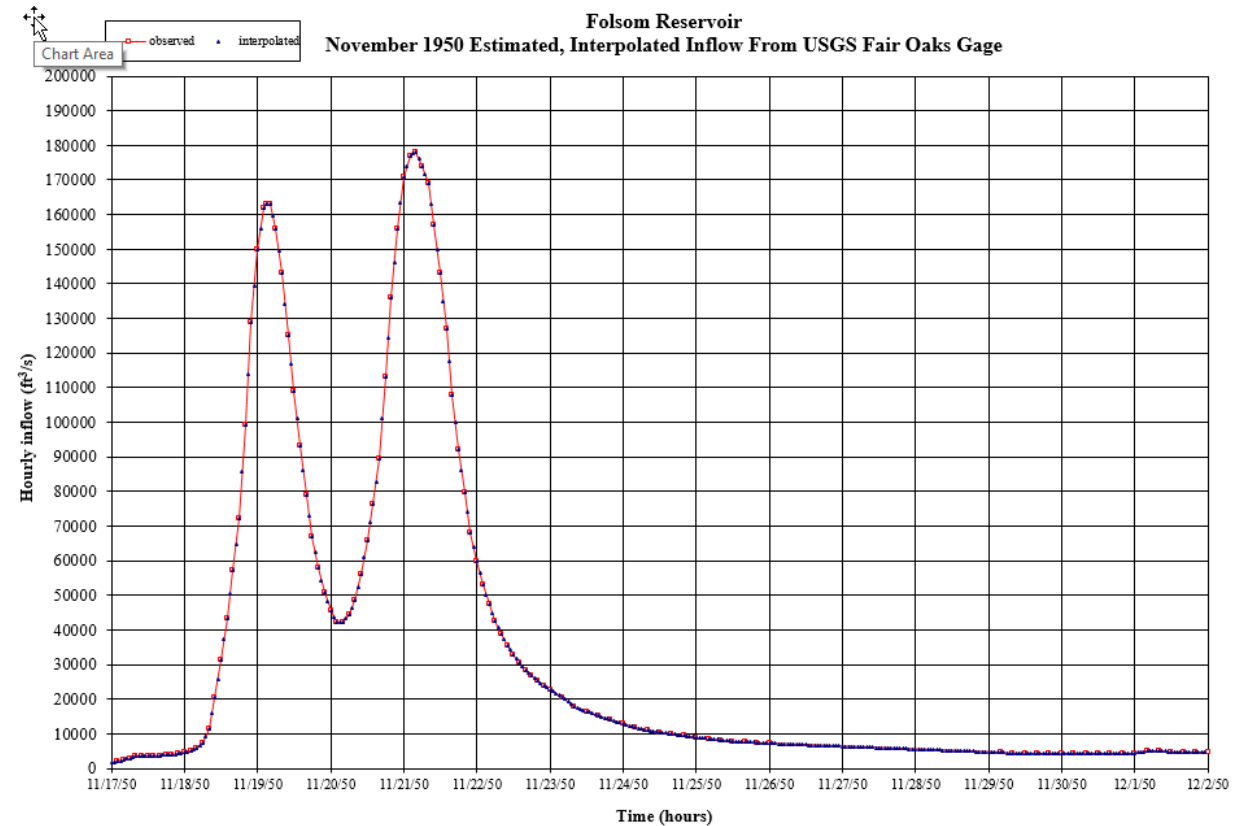
# USGS Instantaneous Data Archive



## Data Sources for Estimating Hydrologic Hazards for Semi-Quantitative Risk Assessments

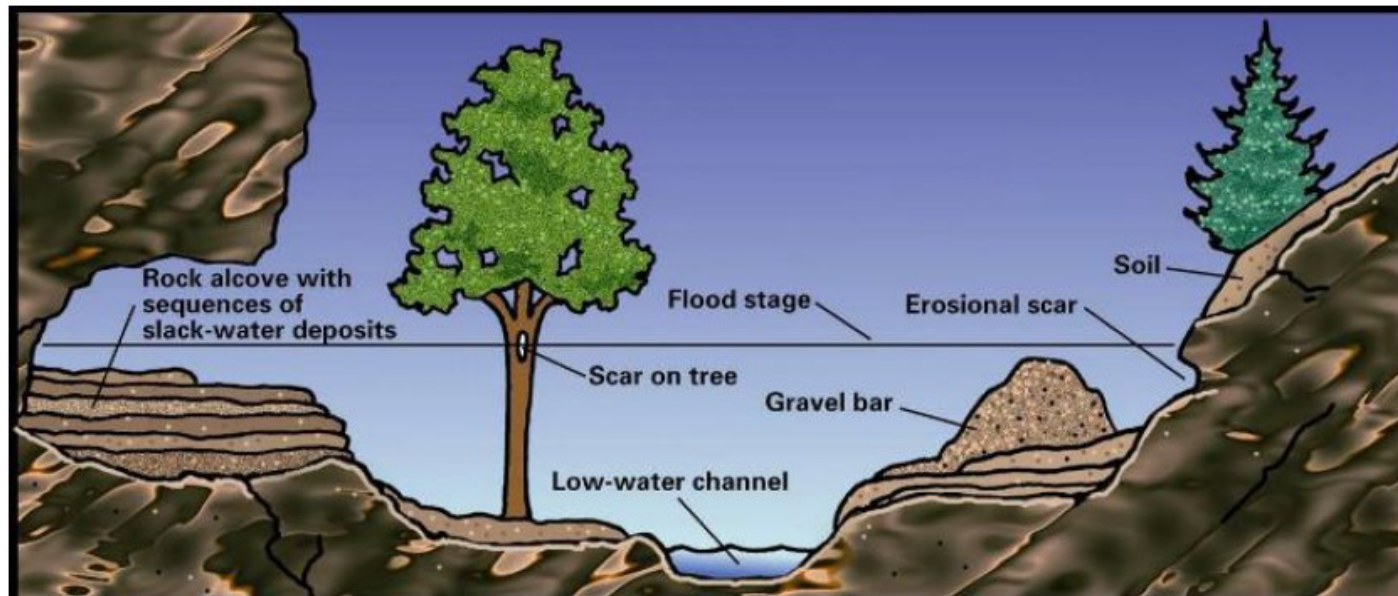
# RMC-TR-2019-07

# oly Papers



# Paleoflood Data

- Paleostage indicator (PSI)
- Non-exceedance bound (NEB)
- Peak flow estimate



# Flood Intervals

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- Historical floods and PSI have large uncertainty
- Range of flow values
- Rule of thumb (+/-20%)
- Engineering judgment
- Quantitative uncertainty analysis





## Project Explorer

- Project Explorer
  - DLS114\_2026\_BestFit2\*
    - Time Series Data
      - Daily\_Inflow
      - DS\_USGS\_Daily\_Inflow
      - DS\_USGS\_Daily\_Inflow\_Area\_Adjusted
    - Input Data
      - Period of Record
      - DS\_USGS\_Area\_Adjusted\_POR
      - Extended Period of Record
      - Historical**
      - Paleoflood
    - Distribution Fitting Analysis
      - Period of Record
      - Extended Period of Record
      - Historical
      - Paleoflood
      - Regional Skew
      - Precipitation Frequency
      - Precipitation Frequency Sensitivity
      - 4-Day Final Bayesian Analysis
    - Bivariate Distribution Analysis
    - Rating Curve Analysis

## Historical

## Data Frame

Summary Statistics

Hypothesis Tests

Seasonality Plot

Density Plot

Histogram Plot

Normal Q-Q Plot

ACF Plot

PACF Plot

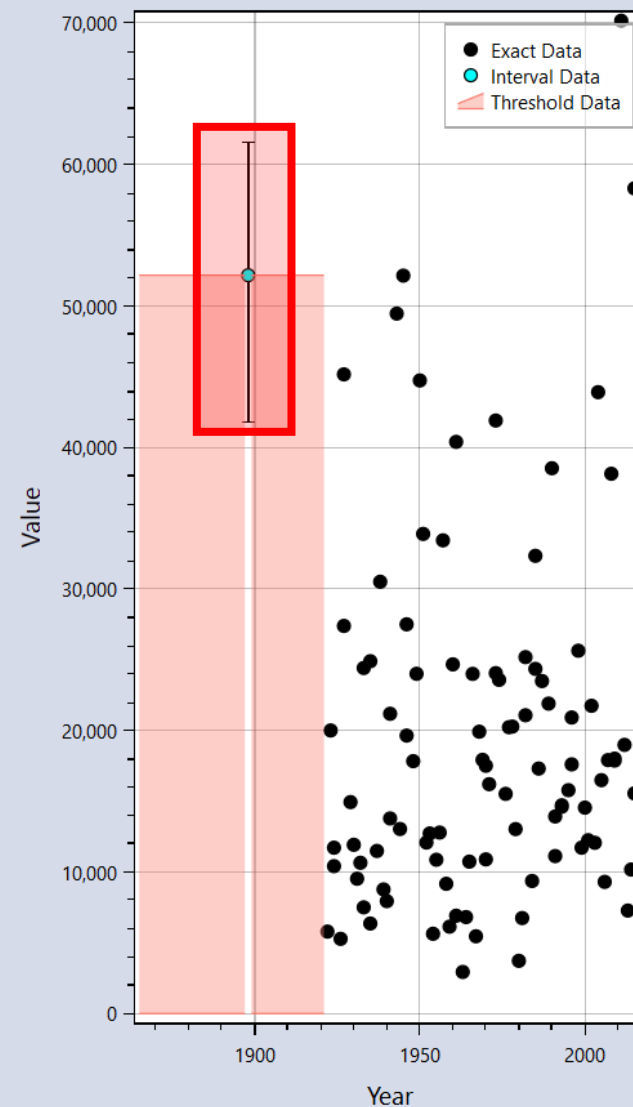
## Exact Data

## Uncertain Data

## Interval Data

## Threshold Data

Index	Lower	Most Likely	Upper	Plotting Position
1898	41,800	52,200	61,600	0.014706



Chronology Plot

Frequency Plot

## Properties

## INPUT DATA PROPERTIES

Name: Historical  
Description: 4-Day Average  
Created On: 1/28/2026 1:47:56 PM  
Last Modified: 1/28/2026 1:48:31 PM  
Unit Label: Value  
Index Label: Year

## EXACT DATA OPTIONS

Data Entry Method: Manual Entry  
Period: 4

## PLOTTING POSITIONS

Parameter: Weibull ( $\alpha = 0.0$ )

## LOW OUTLIER TEST

Multiple Grubbs-Beck Test: ☒  
Threshold Value: 0

Run Test

## Message Window

0 Errors 0 Warnings 0 of 14 Messages 0 of 21 Events

## Input Data

15

A data frame with exact, uncertain, interval-, and threshold-censored data. Used for univariate and bivariate distribution analyses.

# Resources

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- RMC publications:  
<https://www.rmc.usace.army.mil/Library/RMC-Publications/>



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# ? Questions



Dam and Levee  
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