

RECLAMATION

Managing Water in the West

Bulletin 17C Draft

Document

*Hydrologic Frequency Analysis Work Group Meeting
May 7, 2015*



U.S. Department of the Interior
Bureau of Reclamation



 **USGS**
science for a changing world

Outline

- What is Familiar?
 - from Bulletin 17B
- What is New in Bulletin 17C?
 - Improvements to Data and Methods
- What is New in Bulletin 17C?
 - Improvements to Content and Presentation
- What Materials are No Longer Needed?
- Bulletin 17C Draft Document and Examples

What is Familiar?

Prepared in cooperation with the Hydrologic Frequency Analysis Work Group, Subcommittee on Hydrology, Advisory Committee on Water Information

Guidelines for Determining Flood Flow Frequency Bulletin 17C



Techniques and Methods 4-BXX

U.S. Department of the Interior
U.S. Geological Survey

DRAFT: April 20, 2015

---PROVISIONAL---
This should not be referenced, cited, or released without USGS Bureau approval.

HYDROLOGY SUBCOMMITTEE

Guidelines For Determining Flood Flow Frequency



Bulletin #17B
Revised September 1981
Editorial Corrections March 1982

INTERAGENCY ADVISORY COMMITTEE ON WATER DATA

 U.S. Department of the Interior
Geological Survey
Office of Water Data Coordination

What is Familiar?

- Recommended use of Log-Pearson Type III distribution
 - Method of Moments
 - Weighting of at-site and regional skew
- Retained basic structure of document
 - Same general outline of report
 - Main report with numerical appendices
 - Similar report subsections

Bulletin 17C General Outline

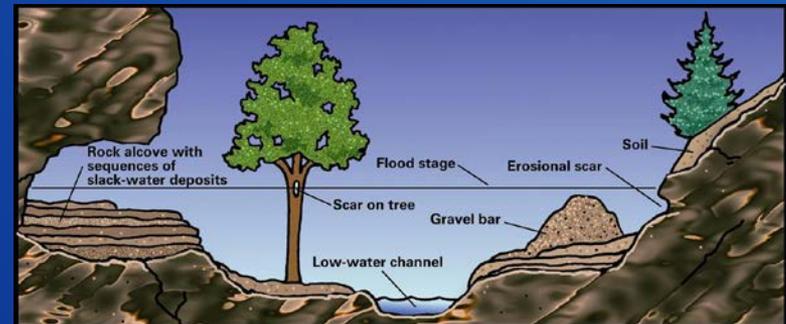
Bulletin 17C Major Section	Bulletin 17B Major Section
Abstract	Forward
Introduction	Introduction
Flood Flow Frequency Information	Information to be Evaluated
Data Assumptions and Specific Concerns	Data Assumptions
Determination of the Flood Flow Frequency Curve	Determination of Frequency Curve
Estimating Regional Skew	
Comparisons of Frequency Curves	Refinements to Frequency Curve
Software and Examples	
Future Studies	Potpourri – Future Studies
Applicability of These Guidelines	
References	References



What is New?

Flood Flow Frequency Information

- Data Sources for a Site
 - Systematic Records
 - Historical Flood Information
 - Paleoflood and Botanical Information
- ***Appendix 2: Data Sources***
 - Discussion where to find information
 - Hyperlinks to sources



What is New?

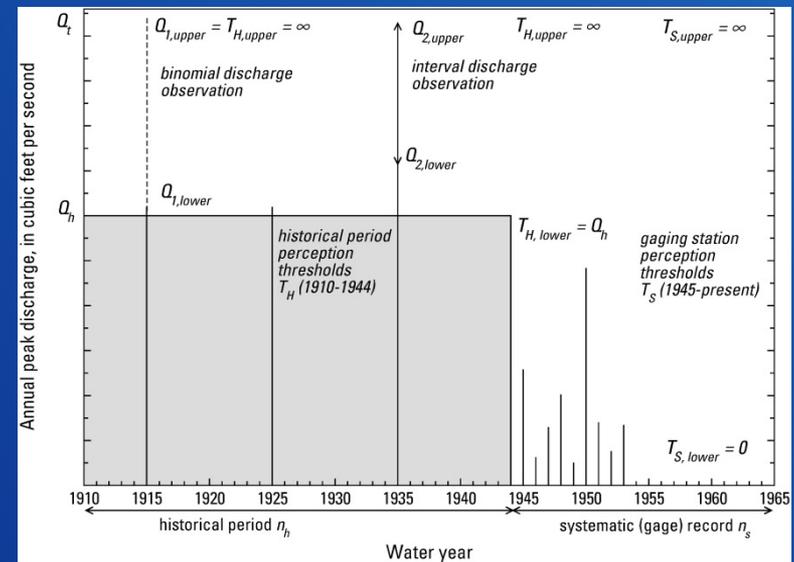
Flood Flow Frequency Information

- Common Issues with At-Site Data Records
 - Broken, Incomplete and Discontinued Records
 - Expanded discussion with illustrations
 - Zero Flows and PILFs
 - Clear presentation and discussion of phenomena with illustrations

What is New?

Flood Flow Frequency Information

- Data Representation using Intervals and Thresholds
 - Flood data are represented by flow intervals ($Q_{Y,lower}$, $Q_{Y,upper}$) and perception thresholds ($T_{Y,lower}$, $T_{Y,upper}$)
 - Includes notation
 - Definitions
 - Examples



What is New?

Data Assumptions and Specific Concerns

- Randomness of Events
 - Recommendation for Initial Data Analysis
 - **Appendix 3** describes the steps and presents an example
- Climate Variability and Change
 - Revised Statements; option for time-varying parameters

What is New?

Determination of the Flood Flow Frequency Curve

- Plotting Positions
 - Multiple thresholds (Hirsch-Stedinger)
- Zeros and Identifying PILFs
 - Multiple Grubbs-Beck Test; ***Appendix 4***
- Expected Moments Algorithm
 - Equations, definitions; ***Appendix 5***

What is New?

Determination of the Flood Flow Frequency Curve and Estimating Regional Skew

- Record Extension
 - MOVE.1-MOVE.3; *Appendix 6*
- Confidence Intervals; *Appendix 5*
- Estimating Regional Skew
 - Bayesian GLS

What is New?

Content and Presentation

- **Appendix 8** Examples: updated and revised with new examples
- Content in every section updated and revised
- New Figures and Tables throughout
- **References** – updated and extensively revised
- Navigation within document - extensive hyperlinking and external links
- **Glossary** – consistent notation/symbols throughout; expanded definitions

What is No Longer Needed?

Deleted Sections

- Expected Probability – no longer used
- Outlier test K values – replaced with MGBT
- Table of K values – replaced with software
- Flow Diagrams – not needed

Bulletin 17C Draft Document and Examples

- Present draft report
 - Navigate through sections
- Examples (with PeakFQ)
 - Crest-Stage Gage Example
 - Historical and PILF Example
- Crosswalk between Bulletin 17C and 17B
 - *handout*
- Questions and Comments on Draft