



United States Department of the Interior
U.S. GEOLOGICAL SURVEY
Reston, Virginia 20192

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Mail Stop 415

September 29, 2017

Memorandum

OFFICE OF SURFACE WATER TECHNICAL MEMORANDUM 2017.15

SUBJECT: Availability of Techniques and Methods 4-B5, Guidelines for Determining Flood Flow Frequency, Bulletin 17C

This memorandum announces the approval by the U.S. Geological Survey (USGS) of Techniques and Methods Report 4-B5, Guidelines for Determining Flood Flow Frequency (denoted Bulletin 17C) and requires the use of these guidelines for USGS flood-frequency analyses. The report is undergoing final layout, but the near-final draft can be obtained from the Bulletin 17C website: <https://acwi.gov/hydrology/Frequency/b17c/bulletin17c-draft-for-soh-31Aug2017.pdf>.

This current version of the guidelines was drafted under the auspices of the Hydrologic Frequency Analysis Work Group (HFAWG), which operates under the supervision of the Advisory Committee on Water Information (ACWI) Subcommittee on Hydrology (SOH). This report, listed as a Highly Influential Scientific Assessment on the USGS "Peer Review Agenda" (URL: https://www2.usgs.gov/peer_review/), has been through both a public comment period announced through the Federal Register (URL: <https://www.federalregister.gov/documents/2016/02/22/2016-03570/announcement-of-public-review-period-for-a-report-of-the-advisory-committee-on-water-information>), and a rigorous peer review of non-USGS experts. At its September 21, 2017 meeting the SOH recommended that the ACWI adopt the report. Bulletin 17C provides critical updates to the methods for performing flood frequency analyses. Flood frequency guidelines have been published in the United States since 1967 and have undergone periodic revisions. Over 35 years have passed since the last revision of Bulletin 17B in March 1982 (IACWD, 1982). At that time, the authors recognized that continued investigation and improvements of flood frequency analysis and techniques were needed. In fact, Bulletin 17B included a list of areas where additional research was recommended.

Bulletin 17C incorporates changes motivated by four of the items listed as "Future Work" in Bulletin 17B and 30 years of post-17B research on flood processes and statistical methods. The updates include:

- adoption of a generalized representation of flood data that allows for interval and censored data types;
- a new method, called the Expected Moments Algorithm (Cohn et al., 1997, 2001), that extends the method of moments so that it can accommodate interval data;
- a generalized approach to identification of low outliers in flood data (Cohn et al., 2013);
- and an improved method for computing confidence intervals.

Bulletin 17C provides intensive information on data sources and selection, including nontraditional sources such as paleoflood records and rainfall-runoff simulation, record extension through correlation techniques, and flood accounts given in newspapers, journal articles and other informal media to supplement traditional peak-flow data published by the USGS.

Bulletin 17C recommends use of a regional skew to compute a weighted average with the station skew. Using the methods described in Bulletin 17C, updated regional skew values have been developed for many states and regions (<https://acwi.gov/hydrology/Frequency/b17c/supplementary-materials/reports.html>), but additional work is needed to develop these tools for other areas of the Nation.

Use of Bulletin 17C is not required for applications needed to characterize low-magnitude, high-frequency floods less than that associated with the 0.10 annual exceedance probability. However, use of Bulletin 17C is required for all other USGS flood-frequency analyses.

The USGS software program PeakFQ (Veilleux and others, 2014) has been updated to implement the flood frequency procedures in Bulletin 17C. The current available version is PeakFQv7.1. However an updated version, PeakFQv7.2, is expected for release in the first quarter of FY2018. The software, and all future releases, can be downloaded from: <https://water.usgs.gov/software/PeakFQ/>.

For further information or questions, please contact Andrea Veilleux (aveilleux@usgs.gov).

//signed//

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Distribution: GS-W All

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