

Hydrologic Frequency Analysis Work Group (HFAWG) report to the Subcommittee on Hydrology for the February 6, 2014 meeting

At the August 19, 2013 meeting of the Subcommittee on Hydrology (SOH), the SOH requested the HFAWG to (1) clarify the definition of PILFs (Potentially Influential Low Flows) and (2) provide computations of 21 sites with low flow outliers using the 25% percentile as the threshold to start the PILF screening.

As it turns out, there are only 13 stations of the 82 stations where more than 25 percent of the sample was identified as low peaks by the Multiple Grubbs-Beck (MGB) test (starting the censoring at the median). Tim Cohn, USGS, provided test results for these 13 stations with estimates of the 1-percent chance discharge and number of low peaks identified by starting the censoring at the median and the 25th percentile. Those results were provided to HFAWG members with an email on October 26, 2013 along with a short narrative provided by Jerry Stedinger. These results were discussed briefly at the October 28, 2013 SOH meeting.

Different people looking at the results from just 13 stations will draw different conclusions about the merits of censoring starting at the median versus the 25th percentile. Jerry Coffey provided comments on the test results on January 21, 2014 that differed from the conclusions originally provided by Jerry Stedinger. The sample of 13 stations is not really a sufficient sample to make a definitive decision.

After interacting with members of the Testing Group, I suggested to the HFAWG that we move forward as follows:

- The Testing report will be revised to clarify the definition of PILFs and why it is important to start the censoring at the median,
- The results of censoring at the 25th percentile will be added to the Testing Report and a more detailed description will be provided of the results and what they mean, and
- The revised Testing Report will be sent out in the near future for review. The Testing Report will be published by USGS and will be documentation for why the new procedures were adopted for Bulletin 17C.

The HFAWG will proceed with drafting Bulletin 17C for the following reasons:

- The use of the current MGB test will be recommended in Bulletin 17C, not required. That is, the MGB test will be the default approach but the analyst can lower the censoring threshold if they believe the resultant discharges are not reasonable. The Monte Carlo simulations that Tim Cohn performed for the Testing Report demonstrated that the EMA/MGB procedure performed better than the current Bulletin 17B approach.
- Experience in the western US has demonstrated that in some cases it may be necessary to treat up to 50 percent of the sample as low peaks. In the western states about 20 percent of the stations have a significant portion of the sample (greater than 25 percent) with zero flows or very low (non-flood) events.
- A paper was published in Water Resources Research that describes the MGB test. That is, we have some acceptance of the MGB methodology within the hydrologic community.

- There will be a public review period for Bulletin 17C and the EMA/MGB methodology will receive additional review.

The HFAWG will move forward with drafting Bulletin 17C and submit a draft to the SOH and eventually the ACWI for their review. Bulletin 17C will also receive public review by a larger group of engineers and hydrologists. Any technical issues will be resolved during this review process.

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