

**Hydrologic Frequency Analysis Work Group (HFAWG) Conference Call
Summary of Discussion
March 8, 2006**

John England with the Bureau of Reclamation in Denver, Colorado arranged for a 2-hour conference call on March 8, 2006 from 11:30 am to 1:30 pm Mountain Time. The following persons participated on the conference call:

Beth Faber – U.S. Army Corps of Engineers
Gary Estes
Jerry Coffey
John England – Bureau of Reclamation
Ken Bullard – Bureau of Reclamation
Don Woodward – American Forests
Jery Stedinger – Cornell University
Claudia Sheer – Natural Resources Conservation Service
Don Moore - Natural Resources Conservation Service
Martin Becker
Kenny Eng – U.S. Geological Survey
Zhida Song-James – Michael Baker, Jr.
Will Thomas – Michael Baker, Jr.
Geoff Bonnin – National Weather Service

Scope of our evaluations

Geoff Bonnin began the discussion with the question – Why limit our evaluations to the Expected Moments Algorithm (EMA)? Geoff asked if we could state that we have done a review of all procedures and that EMA and the Pearson Type III distribution was the best approach.

Jery Stedinger thinks that we can state that the Pearson Type III distribution is as good as any distribution based on recent papers and investigations. Also recent papers indicate that EMA performs about as well as Maximum Likelihood procedures.

The general consensus was that we should not give the impression that the Federal government could not muster enough funds to test the best procedures. That is, we should not indicate that we are testing EMA and making other limited revisions because of lack of resources. We should demonstrate that EMA and the other revisions are reasonable and needed changes in Bulletin 17B. Zhida Song-James commented that we should stress that we are in Phase I of our evaluations and will do additional and more detailed research later.

Geoff Bonnin described the independent review process that National Weather Service (NWS) has been using for the precipitation frequency reports like NOAA Atlas 14

whereby a number of persons outside of NWS are asked to provide review comments. This process does not include the more formal process of announcing the release of the precipitation frequency reports in the Federal Register and asking for comments.

Detailed evaluation (testing) plan

John England described the detailed scope of work that was distributed to the HFAWG members on March 6, 2006. John's proposal for comparing EMA and Bulletin 17B procedures centered on Monte Carlo simulations and he described several ways to compare the two approaches using mean square error and bias statistics. He also recommended data-based comparisons for 30 to 60 actual data sets to demonstrate that EMA works in practice.

Beth Faber suggested an approach for making the Monte Carlo simulations more robust and that was to generate data from other distributions and then fit the log-Pearson Type III distribution to these data. She also suggested generating high and low outliers and adding to the simulated data sets. She thought that the true (population) T-year flood discharge could be determined in this process and that mean square error and bias statistics could be used to evaluate EMA and Bulletin 17B.

Data issues

After some discussion of John England's proposal, it was agreed that we would first test EMA and Bulletin 17B on actual data sets and see what differences may exist. John indicated that he was in agreement with this idea and indicated the statistics from the actual data could be used later in a Monte Carlo simulation.

Jerry Coffey raised concerns about using historic data together with more current data in the frequency analysis because of possible time trends and heterogeneity of the data. He was particularly concerned the use of paleoflood data. Zhida Song-James also had concerns about using paleoflood data.

Martin Becker suggested using some of the gaging station data that was used in the low-outlier testing for Bulletin 17B that was done in the 1977-81 timeframe. Jerry Stedinger suggested that we do split-sampling testing using the actual data sets like Bob Hirsch and he did in some papers in the mid 1980s. Jerry suggested that we use very long observed data records like the Red River of the North in order to do meaningful split-sample testing. Kenny Eng suggested that we used stations from the USGS HydroClimatic Data Network (HCDN) because these stations represented unregulated records free of significant land-use changes.

Action item – Will Thomas will compile data for 50-60 gaging stations that meet the criteria discussed above. At this time, we will not include any paleoflood data in the actual data sets. The compilation of this data set will be coordinated with Martin Becker, Don Woodward and Jerry Coffey. Will Thomas agreed to compile this data set by March 30.

Software issues

Martin Becker asked if we had acceptable EMA software available for testing. John England indicated that he had been using his EMA software for several years but that it was not the same as that currently being used by Tim Cohn. Beth Faber indicated USACE also was developing EMA software that would be in the new Windows version of HEC-FFA. Kenny Eng indicated that the new Windows version of the USGS Peakfq program was about ready for release and would also include EMA software. Obviously different versions of EMA software exist.

Action item – John England, Tim Cohn, Beth Faber and Jerry Stedinger will determine the attributes of acceptable code for implementing EMA. The objective is to make sure that EMA code used for testing will have all the capabilities so that EMA is given a fair evaluation. The EMA code should be finalized in April so that testing of the actual data sets can begin at that time.

The conference call ended on a positive note that we were moving forward with a testing plan and making progress toward a possible revision of Bulletin 17B.

Will Thomas
HFAWG Chair
March 19, 2006