SUMMARY OF THE July 23, 2015 MEETING OF THE ADVISORY COMMITTEE ON WATER INFORMATION (ACWI) SUBCOMMITTEE ON HYDROLOGY (SOH)

1. **Welcome**

The July 23, 2015 meeting of the Subcommittee of Hydrology (SOH) was held at the U.S. Geological Survey headquarters in Reston, Virginia.

At 12:35 SOH Chairman, Victor Hom, called the meeting to order. Vic provided a brief overview of the Advisory Committee for Water Information (ACWI) and SOH. The purpose of the SOH is to help to improve the sharing of water information. The SOH meets on a quarterly basis. Its workgroups meet more frequently.

ACWI has 10 workgroups: (1) Groundwater, (2) SOH, (3) Sediment, (4) Spatial Water Data, (5) Water Resources Adaptation to Climate Change, (6) NAWQA Liaison, (7) Monitoring Methods Control Board (Water Quality), (8) Water Quality Methods Board (labs), (9) Sustainable Water Resources Roundtable, and (10) Monitoring Challenges.

The SOH has 4 active workgroup (WGs): Hydrologic Frequency Analysis Workgroup (HFAWG), Extreme Storms Estimation Workgroup (ESEWG), Hydrologic Modeling Workgroup (HMWG), and the Satellite Telemetry Interagency Working Group (STIWG).

Vic provided a summary of past SOH meeting feature presentations. The ACWI/SOH webpage provides a complete list.

2. **Words from our Host**

Robert Mason welcomed the group and provided the facilities orientation.

3. **Roll-Call**

Vic led the roll-call and announced that the committee quorum was present. Twenty SOH members and guests attended the meeting in person and 22 attended it by phone. (See attendance matrix as attachment 1 below.)

4. **Review and Approval of Agenda**

Next Vic reviewed the agenda and asked for a motion to accept it. Jack Sharp moved that the agenda be approved and Claudia Hoeft seconded the motion. Without objection, the motion was approved and the agenda accepted.

5. **Feature presentation**

Guest Introduction -Vic introduced Will Thomas and John England, the featured speakers. Will chairs the Hydrologic Frequency Workgroup (HFAWG) that has been working on drafting the new "Bulletin 17C" guidelines. John England is the lead author.

[[NOTE: In providing the following notes, the vice-chair does not assert that they represent the exact sequence of events. The discussion was somewhat haphazard and it was too difficult to keep track of the interruptions upon interruption. Instead, the notes provide a summary of Will's and John's presentation and lists the various questions, responses, and action item items that accumulated throughout.]]

Will provided an overview of the history of the "B17C" endeavor including a charge from the SOH to draft the document. The HFAWG has had 18 meetings and minutes are posted on the HFAWG website (http://acwi.gov/hydrology/Frequency.)

Will reported that recent developments concerning the HFAWG activities and draft include:

- June 2013 – HFAWG voted to accept recommended revisions to Bulletin 17B (recommendations are given on the HFAWG web site)
- August 2013 – SOH voted in favor of HFAWG drafting a new Bulletin 17C
- March 2014 – USGS released PeakFQ Version 7 that implements recommended Bulletin 17C methodology
- April 2014 – HFAWG completed the testing report on *Evaluation of Recommended Revisions to Bulletin 17B* – colleague reviews received, to be published as USGS report
- April 20, 2015 – first draft of Bulletin 17C was completed and distributed to HFAWG members for review
- May 7, 2015 – HFAWG met at office of Michael Baker to discuss the April 20, 2015 draft of Bulletin 17C; Voted, 11-1, to forward Bulletin 17C with revisions to the SOH for their review
- June 24, 2015 – revised version of Bulletin 17C provided to SOH members (posted on John England's Goggle site

SOH resources concerning B17C include:

- Documents -Bulletin 17C and Appendix materials, including Appendix 3 Initial Data Analysis and Appendix 9 Flood Frequency Examples, are available at:

https://sites.google.com/a/alumni.colostate.edu/jengland/bulletin-17c#B17CDraft

- An EMA FAQ is available at:

http://acwi.gov/hydrology/Frequency/b17_swfaq/EMAFAQ.html

- Compilation of various presentations, journal articles, and reports on theory and

applications used in developing the draft Bulletin 17C are available provided:
https://sites.google.com/a/alumni.colostate.edu/jengland/bulletin-17c#Refs

- USGS PeakFQ 7.1 software includes the recommended procedures described in Bulletin 17C:

http://water.usgs.gov/software/PeakFQ/

- A USGS Fact Sheet describes PeakFQ 7.0:

http://pubs.usgs.gov/fs/2013/3108/

The USACE HEC-SSP is being revised to include the Bulletin 17C methodology. The USBR is revising their EMFREQ frequency program to include the Bulletin 17C methodology

Will reported the purpose of his and John's presentation was to Obtain approval of SOH to move forward with a public comment period on Bulletin 17C. If agreed, the USGS Office of Water Information will post Bulletin 17C on a public web site for comment and announce the review period through the Federal Register. The Chair of the SOH will inform ACWI of the status of Bulletin 17C at the upcoming ACWI meeting on October 26, 2015.

Once the public comment period id completed the HFAWG will revise Bulletin 17C based on public comment and inform SOH of the revisions. Once that document is complete, the HFAWG will return to obtain final approval from SOH and ACWI for publication. One that approval is obtained the USGS will publish B17C as a USGS "Techniques and Methods" report.

John England provided additional detail. The B17C report authors have developed a draft document in accordance to the agreement developed by the SOH and included in the July 2014 meeting summary as distributed to SOH membership in October of that year.

John reviewed the peer review, comment and approval process steps, a schedule, and reported on their status. A USGS peer review is taking place in addition to the steps listed by Will, as part of the USGS publication process. Annette Goode (USGS) is coordinating the USGS colleague review process. For the public review phase, USGS Office of Water Information will coordinate comments.

Claudia -Has the HFAWG developed a "communications plan" for the peer review or public comment period? Does the Data Quality Act (DQA) apply?

Dave Raft –The DQA does apply. B17C likely fits the definition of "influential science" as defined by the Office of Management and Budget (OMB). The process requires formal peer reviews and establishes guidelines for that process. There is also a requirement to publish a notice of the peer review.

Jerry Coffee –Committees are right to be concerned about the DQA and the peer review

process. It does not seem to have been met.

Dave Raft –I don't share those concerns. It can still be done.

Martin Becker –Why are we publishing B17C as a USGS report? If it is a USGS report, what is the SOH approving it?

Claudia –Is the report complete? She would like to see the "final draft" to "press" (Mason –I assuming she meant before it was submitted for "public comment"?

Sam Lin –The draft includes words like "required use" which are unacceptable to FERC. The document can only "request" or "recommend".

Siamak Esfandiary –The draft should use words like "Federal" instead of "National".

Claudia and Dave Wells –The document presents "guidelines" not regulations or requirements and should adopt that tone.

As the time allocated to the discussion of the B17C discussion had been extended and then expired, the Chair intervened, tabled further discussion regarding B17C until the regular meeting business was completed.

6. **Review of previous meeting summary**

Vic introduced the July meeting summary. Vic thanked Robert for providing the notes and suggested that unless there was an objection, he thought it best for the group to accept them without further discussion.

7. **Status of Action Items From Prior Meetings**

Due to the lack of time, Vic reported that the chair would table consideration on previous action items.

8. **Announcements and Business Reports**

<u>Announcements</u>

Vic introduced Mr. Curt Jawdy, Tennessee Valley Authority. TVA would like to rejoin the SOH and become an active participate.

<u>Business Reports</u>

NWS –Vic Hom

NWS Business report provided in attachment 2 included three items of potential interest to SOH members: 1) The NWS held is Nat'l hydrology meeting in Tuscaloosa in April; 2) The NWS celebrated the grand opening of the "Nat'l Water Center"; 3) and over the summer, NWS was sponsoring a NSF-CUAHSI program called the "Nat'l Flood interoperability experiment". *See NWS report as appendix 2.*

FERC –Sam

FERC staff participated in multiple flood related activities of some examples listed below:

- Emergency Action Plan functional exercises for dams
- A conference call with Georgia Power to discuss ongoing flood frequency and Inflow Design Flood (IDF) studies for the Tallulah Falls Dam located on the Tallulah River in Rabun County, Georgia
- A Board of Consultants meeting to review the site specific Probable Maximum Precipitation (PMP) / Probable Maximum Flood (PMF)
- (See appendix 3 for details).

NRCS –Claudia

NRCS was forming a working with ASCE on MOU on common interests.
The NRCS Handbook on Hydrology –Curve number methods, Chapter 4 is in the process of being updated.

ASCE ERWI meeting in Reston in August

9. **Workgroup Reports**

- **HMWG**

  No report was provided.

- **HFAWG**

  As the primary meeting presentation was about the status of Bulletin 17, no addition workgroup report was provided. However, a letter received from John England and forwarded to Robert and Vic is included as appendix 4.

- **ESEWG**

  The Extreme Storm Events Work Group (ESEWG) met on Monday, May 18, 2015 at the NOAA/National Weather Service's office in Silver Spring, Maryland. Over 40 persons participated. The meeting focused on a presentation, "**Uncertainty Analysis for Probable Maximum Precipitation Estimates**" by Zoran Micovic, Ph.D., P.Eng., British Columbia (BC) Hydro,

Canada; Mel Schaefer, Ph.D., P.E., MGS Engineering Consultants, USA; and George Taylor, M.S., CCM, Applied Climate Services, USA. The next ESEWG meeting is scheduled for July 30, 2015 @2:00 p.m. EDST. (The full report of the ESEWG is attached as Appendix 5.)

- **STIWG**

  There was no report. However, Vic reported that the SOH membership had voted to accept the new STIWG terms of reference.

10. **Review Actions and Plans for next SOH meeting** Vic Hom

At the close of the business and workgroup reports the SOH renewed discussion of the next steps for B17C. The chair formulated and voiced several action items including:

1. Members should provide comments on B17C to Will Thomas and cc: Victor Hom.
2. Victor to coordinate with Tom Nicholson on chartering adhoc team to establish communication team on B17c with respect to interagency coordination, feedback, plans before and after Federal Register.
3. Robert to provide USGS guidance on items requiring Federal Registrar notice.
4. David Raff will send sample of interagency activity in which USBR is seeking comment via Federal Registrar.
5. Tom will look into NRC process in soliciting Federal Registrar comments.
6. Tom and Victor to assimilate info about respective agency guidance and also reach out to Dr. Coffey with OMB. As suggested, it might be beneficial to have OMB official at next meeting.

Additional action items concerning other business were also formulated including:

1. Provide nominations for SOH VP; Victor to draft ballot.
2. Victor to send ballot and 30-day deadline for vote.
3. Business Reports to be posted on website and SOH members to review and provide comments if needed to the chair of respective WG of member organization.
4. Jerry Webb to discuss with Claudia Hoeft and Victor Hom to confirm Claudia as Vice-Chair of HMWG and establish member roster.

11. **The Meeting Adjourned**

Vic brought the meeting to a close.

Attachment 1. Roll call and attendance and vote on STWIG terms of reference.

ACWI SOH Quarterly Meeting July 23rd

Where: USGS Headquarters 12201 Sunrise Valley Drive Reston, VA 20192 (http://maps.google.com/maps?q=USGS%20Headquarters%2012201%20Sunrise%20Valley%20Drive%20Reston%2C%20VA%2020192)

SOH Quarterly Meeting
1230PM-330PM Eastern Time

1. Feature Presentation: The Guidelines for Determining Flood FlowFrequency Bulletin 17C. –Mr. Will Thomas, the chair of SOH's Hydrologic Frequency Analysis Workgroup (HFAWG), John England, the lead author of the B17C, and Other members of HFAWG.
2. SOH Announcements
3. SOH Business Meeting
4. SOH Nominations

44 participants	Attend In Person	Attend Remotely	Cannot Attend
Victor Hom (NWS)	✓		
Will Thomas (ASFPM	✓		
Sam Lin (FERC)	✓		
Ben Pratt (NHWC)	✓		
Ian Ferguson (USBR		✓	
David Wells (EPA)	✓		
Don Woodward (GE			✓
Siamak Esfandiary (	✓		
Curt Jawdy (TVA)		✓	
Bill Merkel (NRCS)		✓	
Martin Becker (Beck		✓	
Arndt Gossel, EPA	✓		
Kevin Stewart, NHW		✓	
Ted Engman (NASA	✓		
Harry Jenter, USGS	✓		
Jack Sharp (NSF)	✓		
Brian Beucler (FHW	✓		

Brian Beucler (FHW	✓		
Jack Felbinger (OSM		✓	
David Raff		✓	
Robert Mason (USG	✓		
Wade Crow (ARS)		✓	
Li-Chuan Chen, NOA		✓	
Rajiv Prasad		✓	
Bill Kappel (AWA)		✓	
Ken Fearon (FERC)		✓	
Laura Chap, FEMA	✓		
Julie Kiang	✓		
John England	✓		
Robert Mason	✓		
Ron McCormick (BLI		✓	
Ed Tomlinson (ASC)		✓	
Mohammad Haque (		✓	
Claudia Hoeft	✓		
Mike Bonadonna (OI		✓	
Jason Caldwell (Met		✓	
Jerry Webb		✓	
Dongsoo Kim		✓	
Thomas Aird (NRC)		✓	
Elena Yegorova		✓	
Fernando Ferrante		✓	
Tom Nicholson	✓		
Bob Hirsch	✓		
Kate Flynn	✓		
Tim Cohn			
	20	**22**	1

Comment

Attachment 2. NWS Business report

National Hydrology Program Managers Conference

In mid-May, the NWS held the 2015 National Hydrology Program Manager's meeting in Tuscaloosa, Alabama. NWS personnel from the WFOs, RFCs, WPC, NWC, regions, and headquarters, and partners, stakeholders and academia, such as USGS, FEMA, USACE, and NYDEP attended the meeting, which took place from May 11 to 15, 2015. The meeting's theme was "Leveraging the National Water Center to transform NWS water resources services to build a Weather-Ready Nation". The meeting featured an "Open House" and an "e-Poster Session" at the National Water Center. Poster abstracts, posters, presentations, and notes from the meeting are available for download via the National Hydrology Program Managers Meeting

- https://sites.google.com/a/noaa.gov/nws-hydro-managers-meeting/?pli=1

National Water Center

On May 26, NOAA and partners officially opened the new National Water Center building on the campus of the University of Alabama on May 26, 2015. This center is poised to become an incubator for innovative breakthroughs in water prediction products and services. The center will be a hub of integrated water prediction and forecasting for the federal government. Scientists and forecasters at the 65,000 square-foot building will collaborate to provide the nation with enhanced water-related products and services to support water management decisions across the country. Bringing experts together in this new collaborative center provides an unprecedented opportunity to improve federal coordination in the water sector to address 21st century water resource challenges, such as water security, and analysis and prediction of hydrologic extremes, like droughts and floods. For pictures and video, please see:

- http://www.noaanews.noaa.gov/stories2015/20150526-national-water-center-opens-on-university-of-alabama-campus-in-tuscaloosa.html

The Summer Institute of the National Flood Interoperability Experiment.

The National Water Center and the University of Alabama hosted a seven week intensive Summer Institute. The Summer Institute took place June 1 through July 17, 2015 and included 44 graduate students from 19 universities. The program provided students an opportunity to participate in developing and modifying a prototype NFIE flow modeling and data testbed that is being created based on the NHDPlus geospatial dataset describing the nation's river network. In addition, the Summer Institute provided training on the following topics:

- Modern information services made available through web services
- Introduction to hydrometeorologic models such as WRF-Hydro and RAPID
- Distributed high performance computing environments
- Best practices in programming and application development

The students worked on many projects, among them river channel representation and flood inundation mapping. CUAHSI, NWS, and UA were the main pillars for this opportunity. Please see the CUAHSI website on NFIE for additional details https://www.cuahsi.org/NFIE.

Attachment 3. FERC Business report

FERC staff participated in multiple flood related activities of some examples listed below:

- Emergency Action Plan functional exercises for dams, for example, on June 24 the Wissota Hydroelectric Project located on the Chippewa River in Chippewa County
- A conference call with Georgia Power to discuss ongoing flood frequency and Inflow Design Flood (IDF) studies for the Tallulah Falls Dam located on the Tallulah River in Rabun County, Georgia
- A Board of Consultants meeting to review the site specific Probable Maximum Precipitation (PMP) / Probable Maximum Flood (PMF) studies for the North Umpqua Hydroelectric Project located on the North Umpqua and North Fork Rogue Rivers in southern Oregon. The BOC is charged with reviewing the methodologies, assumptions and conclusions of the study and identifying any outstanding issues.

Attachment 4. HFAWG report for July 2015

Subcommittee on Hydrology, Advisory Committee on Water Information
Hydrologic Frequency Analysis Work Group (HFAWG)

MEMORANDUM

TO: Will Thomas, Chair, Hydrologic Frequency Analysis Work Group

FROM: John England

SUBJECT: Bulletin 17C Document Status

DATE: June 26, 2015

This memorandum is a status of the Bulletin 17C document drafts, reviews, and revisions. The Bulletin 17C document will be published under the USGS "Techniques and Methods" report series.

Bulletin 17C Document and Peer Review Process

The review, comment, and approval process for this document is described below and listed in Table 1. These steps were outlined by Robert Mason in October 2014; Will Thomas submitted them to HFAWG via email on January 20, 2015.

1. The HFAWG will complete the draft "Bulletin 17C".
2. HFAWG members will review the draft report for HFAWG approval (May 2015).
3. HFAWG will present the draft report to the SOH at their July 2015 meeting.
4. SOH will discuss the draft and vote on a motion to proceed with distribution of the draft for public comment.
5. The USGS, through the Office of Water Information (OWI), will develop a "Bulletin 17C" pubic website for public distribution of the draft document and create a process for compiling public comments.
6. The USGS OWI will announce the development and review of the Bulletin 17C draft through the Federal register as "proposed guidelines for computing flood frequencies" and solicit comments.
7. The HFAWG will review the public comments and draft responses. The comments and responses will be provided to the SOH for discussion.
8. The SOH will vote on a motion to proceed with the formal publication of the guidelines.
9. Once the SOH has approved the document, it will be presented to the ACWI for approval.

10. Once the ACWI has approved the publication, the USGS will proceed with publication of the draft though the normal USGS publication process. The plan is to publish the document as a USGS "Techniques and Methods" to facilitate the easy maintenance, discovery, and formal citation of it.

The peer review, comment and approval process steps, a schedule, and a status are listed in Table 1. A USGS peer review is taking place in addition to the steps listed above, as part of the USGS publication process. Annette Goode (USGS) is coordinating the USGS colleague review process. For the public review phase, comments will be coordinated by USGS Office of Water Information.

Table 4: Bulletin 17C Peer Review, Comment and Approval Process as of June 26, 2015

Peer Review, Comment, and Revisions	Approvals	Schedule	Status
Bulletin 17C writing team prepares draft document for HFAWG		April 20, 2015	Submitted via email April 20, 2015
Bulletin 17C writing team solicits USGS Colleague peer review on draft sent to HFAWG		April 23, 2015	Reviews being obtained from three independent experts
HFAWG members review document and submit comments to authors	HFAWG discuss draft and vote on a motion to proceed with submitting to SOH	May 7, 2015	Voted May 7, 2015 to make revisions and submit to SOH
HFAWG Comments due to authors		May 20, 2015	
Bulletin 17C writing team revises draft document based on HFAWG comments and submit to SOH		June 23, 2015	Submitted via email/web to SOH Chair June 19, 2015
USGS Colleague peer reviewers perform reviews and submit comments to authors		June 30, 2015	Comments from three reviewers received June 23, 2015
HFAWG presents report to SOH	SOH discuss the draft and vote on a motion to proceed with distribution of the draft for public comment	July 23, 2015	
Authors revise draft addressing USGS colleague reviews and SOH comments, submit to USGS for publication approval	USGS Director Approval for publication of draft for public review	August 15, 2015	
USGS Office of Water Information (OWI), develops a Bulletin 17C website for public distribution of the draft document and compiling public comments		August 15, 2015	
Public Review: announcement by USGS OWI (Federal Register)		September 15, 2015	

Public Review/Comment Period (60 days) ends		November 15, 2015	
Authors and HFAWG respond to public comments; revise draft		December 15, 2015	
HFAWG presents revised draft, comments and responses to SOH	SOH votes on a motion to proceed with the formal publication of the Guidelines	December 2015	
SOH presents report to ACWI	ACWI approval of the Guidelines	January 2016	
USGS prepares final report for publication	Publication of Bulletin 17C	March 2016	

Future revisions of Bulletin 17C will be handled in a similar fashion, through the Hydrologic Frequency Analysis Work Group and Subcommittee on Hydrology.

7/21/2015

Appendix 5. Report of the Extreme Storm Events Work Group to the SOH at the July 23, 2015 Meeting by Tom Nicholson, Chair and Marian Baker, Vice-Chair

The Extreme Storm Events Work Group (ESEWG) met on Monday, May 18, 2015 at the NOAA/National Weather Service's office in Silver Spring, Maryland. The meeting was hosted by Dr. Sanja Perica, NOAA/NWS and her staff. The meeting was transmitted via Webex to over 40 participants. The meeting focused on a presentation, "**Uncertainty Analysis for Probable Maximum Precipitation Estimates**" by Zoran Micovic, Ph.D., P.Eng., British Columbia (BC) Hydro, Canada; Mel Schaefer, Ph.D., P.E., MGS Engineering Consultants, USA; and George Taylor, M.S., CCM, Applied Climate Services, USA. The presentation was based upon a recently published, peer-reviewed paper in the Journal of Hydrology (JoH) on "Uncertainty analysis for Probable Maximum Precipitation estimates" (JoH, Volume 521, February 2015, Pages 360–373). Both the paper and presentation emphasized the need to address uncertainties in PMP estimates. The presenters mentioned, both in their abstract and during the presentation, that their study was a first-of-a-kind in performing an uncertainty analysis of PMP-derived estimates through meteorological analyses. Their methodology was tested on the La Joie Dam watershed in British Columbia. The test study indicated that the commonly used single-value PMP estimate could be more than 40% higher when possible changes in various meteorological variables used to derive the PMP were considered. The findings from their study suggest that PMP estimates should always be characterized as a range of values recognizing that there are significant uncertainties involved in PMP estimation studies. They concluded that they do not know at this time whether precipitation is actually upper-bounded, and if precipitation is upper-bounded, how closely do PMP estimates approach the theoretical limit. (Presentation slides and attendees list are provided.)

Also during the last six months, the writing team drafting a proposal for "Extreme Rainfall Product Needs" met on four occasions, February 10th, March 12th and 26th, and June 9th. A detailed draft outline, and partially completed chapters have been developed. The proposal evolved from the May 15, 2014 ***Workshop to Define Needed Extreme Precipitation Products***. The Workshop Synthesis Report has been completed and will be provided to the ESEWG members for the final review before transmitting it to the SOH.

The next ESEWG meeting is scheduled for July 30, 2015 @2:00 p.m. EDST. The meeting will be via teleconferencing hosted by Marian Baker, U.S. Army Corps of Engineers – Kansas City District. The featured speakers will be Bill McCormick, Chief, Dam Safety Branch, State of Colorado; and Mark Perry, Dam Safety Engineer, State of Colorado. Bill and Mark plan to speak on the "Colorado and New Mexico Plans for a Regional Extreme Precipitation Study." They have expressed interest in receiving technical feedback from

the ESEWG. For details on accessing the meeting, please contact Marian Baker, USACE at Marian.E.Baker@usace.army.mil and telephone 1-816-389-3222.