

**MINUTES OF THE May 1, 2014 MEETING OF THE
ADVISORY COMMITTEE ON WATER INFORMATION (ACWI)
SUBCOMMITTEE ON HYDROLOGY (SOH)**

1. Welcome

The May 1 meeting of the SOH was held at the FEMA Mitigation HQ in Crystal City, VA. The Chairman, Victor Hom, called the meeting to order at 12:40. He thanked Siamac Esfandiary (FEMA SOH representative) and Mark Crowell (FEMA) for hosting the SOH meeting.

2. Words from our Host

Siamac and Mark provided facility orientation and emergency exit procedures. Siamac and Mark welcomed the SOH Crystal City.

3. Roll-Call (See following attendance matrix.)

4. Review and Approval of Agenda

Vic reviewed the agenda and requested a motion that it be adopted. Robert Mason so moved and Tom Nicholson seconded the motion and the agenda was adopted without objection.

5. Approval of the February 2014 Meeting Summary

Victor Hom

Mason reviewed the February meeting minutes. Vic asked that they be approved. Martin Becker so moved, Don Woodard seconded, the motion passed with no objections.

6. Status of action items and Background on SOH

Vic provided an overview of ACWI. ACWI has climate change workgroup, water geospatial data, etc. Jeff Peterson spoke about climate change in the past.

The SOH is focused on SW availability and hazards. SOH has workgroups on flood-frequency (HFAWG), Estimation of Extreme Storms Estimation (ESEWG), Modeling, and GOES satellite telemetry (STIWG) and GIS

7. Feature presentation

- Guest Introduction -Vic introduced featured speaker. Mark Crowell is a coastal geologist with FEMA and he spoke about a draft report and study regarding the impacts of climate and land use change of the National Flood Insurance Program.

- Special presentation (See Mark's ppt.) -The report was written by FEMA and contractors including AECOM and Mike Baker, Jr. (With Will Thomas participating) in response to a GAO review recommendation.
 - History –In 1991 FEMA completed study for Congress investigated Sea Level rise on NFP written by Mike Buckley and Howard (?) NFIP Chief Actuary.
 - Concluded that under 1 and 3 foot SLR by 2100 (based on first IGCCR) NFIP would not be impact by 1 SLR by 2100. NFIP could adjust rates as needed
 - A 3-foot rise would require adaptation. No change needed/
- AECOM (Dave Devocky) had led on report
 - Quantify impacts of cc on floodplains, insured properties, and NFIP
 - Used probabilistic methods not scenarios and Monte Carlo techniques
 - Included River and Coastal flooding
- Used Regression analysis
 - 2000 gages for 20 year
 - Single equation for 100 years flood AEP
 - Impacts based on geographic location
 - Used DA, SL, Storage, IA, dry days, wet days, 27 indices, pop growth and IA growth in 100 and 10 year equations
 - Developed simple regress of streamflow
 - 43 projections subjected to Monte Carlo analysis
 - MC simulations combined with FIS rating curves
- Approach
 - Coastal storms IPCC/CSP
 - Subdivided Zones I to common areas
 - Perform MC flood response
 - Determined insurance impacts
- Monte Carlo Simulations
 - 45% floodplain projected to 45% (30 population growth) 70% based on CC
 - Coastal from 0 to 45%
 - Graphical look (see slide 32)
 - Changes in river flooding (see slide 33)
- Science findings
 - POP in floodplain in SHAs 130-150%
 - 40-54% increase SFHA
 - By 2100 NFIP the holders of policies will double
 - Biggers-Waters Act, 12 Section 100216 b-Authorizes FEMA to include CC impacts
 - 2010 (See paper by Will and Dave Groky pub paper in ASCE journal of Water resources)
 - Vermeer and Rahmstorf (2009) 0.75-1.9m SLR 1990-2100
- Draft report released in 2013
- Tech Mapping Advisory Council to advise FEMA on how to incorporate CC impacts

8. Announcements and Business Reports

- The ESESWG will meet at NRC, Rockville, MD (LATER CHANGED TO NWS, SILVER SPRING).
- The ASFPM conference will be held June 1-6 in Seattle, WA
- The ASCE Environmental Congress will be held in June 1-6 at Portland, Oregon
- FERC Business Report Sam Lin
 - OEP Staff participated in a joint Nuclear Regulatory Commission (NRC) – FERC workshop on Probabilistic Flood Hazard Analysis and SSHAC (Senior Seismic Hazard Analysis Committee) Implementation at the NRC Headquarters in Bethesda, Maryland from April 14 through 16, 2014. The workshop focused on measures to make risk-informed decisions on preventing or mitigating flood hazards at dams and nuclear power plants.
- NWS Business Report Victor Hom
 - Vic highlighted articles in the April 2014 NWS Newsletter, AWARE. The articles of interest to the SOH community from the April 2014 Newsletter AWARE include
 - Flood Inundation Mapping on the Winnebago River at Mason City
 - Community Highwater Mark Sign showing impacts of Hurricane Sandy
 - NWS Flood Safety Awareness page
 - For more details, please see the April 2014 Newsletter (<http://www.nws.noaa.gov/om/Aware/pdfs/14apr-aware.pdf>)
- USGS Business reports (See attachment 2) Shaun Wicklein/Robert Mason
 - **First USGS streamgage turns 125 years old** - The first USGS streamgage, the Rio Grande at Embudo, New Mexico, just turned 125 years old, and the U.S. Geological Survey and many partner agencies commemorated the event on April 22, 2014.
 - **USGS releases new PeakFQ** - The USGS released of the latest version of PeakFQ Version 7.1. This release implements both the existing Bulletin 17B procedures and new procedures proposed by the Advisory Committee on Water Information (ACWI), Subcommittee on Hydrology (SOH), Hydrologic Frequency Analysis Work Group (HFAWG).

9. News from the SOH Workgroups

- HFAWG –Will Thomas (Baker, Jr.) presented the HFAWG report (see attachment)
 - USGS has implemented the new statistical procedures in their PeakFQ flood frequency computer program. Version 7.1 of the PeakFQ program has been completed and is posted on the USGS software page at <http://water.usgs.gov/software/PeakFQ/>.
 - There is a Fact Sheet on the web site that briefly describes PeakFQ Version 7.1.
 - USGS has also prepared some Frequently Asked Questions (FAQs) about the new statistical procedures and there is a link to the FAQs that are posted on the HFAWG web site at http://acwi.gov/hydrology/Frequency/b17_swfaq/EMAFAQ.html. More FAQs will be added in the future as the need arises.
 - The HFAWG is drafting Bulletin 17C, a revised version of Bulletin 17B. The tentative plan is to publish Bulletin 17C as an USGS Circular

After questions and discussion, Martin Becker asked for clarification regarding the process for public comment on the new “Bul 17C”.

Action Item 1 -Martin -Robert to work with Will T formulate proposed process for SOH approval and public comment process and to SOH

- Tom Nicholson presented the ESEWG workgroup report (See attachment 3).
 - The ESEWG Chair attended and presented with the SOH Chair, a discussion of the Workshop and questionnaire to the Interagency Committee on Dam Safety (IC [www.sedhyd.org /2015/](http://www.sedhyd.org/2015/))ODS)/ National Dam Safety Review Board (NDSRB) at their quarterly meeting held at FERC headquarters on April 24, 2014. The State representatives were very enthusiastic about the SOH and ESEWG presentation, and expressed interest in the Workshop and questionnaire.
 - To finalize the Workshop Program and review the questionnaire responses, the ESEWG will have a teleconference on Thursday, May 8, 2014 @2:00 p.m. EDST.
- Claudia Hoeft presented the Modeling workgroup report
 - Jerry Web chairs the Hydrologic Modeling Workgroup, but was not able to attend the SOH meeting.
 - The Federal Hydrologic Modeling Conference is set for April 19-23, 2015. The purpose is to share info on modeling. The conference is held in conjunction with the national Sediment conference. A webpage has been established (URL: [www.sedhyd.org /2015/](http://www.sedhyd.org/2015/)). Abstracts are due June 23rd.)

- The conference will be held in Reno at the Pepper Mill
- Not restricted to Federal employees, but targeted Federal employees
- Doug Glysson to meet with conference hotel and select exhibits coordinator and getting cost estimates for AV and other equipment

10. Review Actions and Plans for next SOH meeting

Vic Hom

- Vic led a discussion to plan the next meeting of SOH. The group agreed that the next meeting would be held at 12:30 on July 24, 2014 at the USGS HQ in Reston, Virginia. An announcement will be forthcoming.

11. The Meeting Adjourned

Attachment 1 –Roll call. Yellow indicates attendance.

SOH -		Organization	Participation
David	Bylsma	US Environmental Protection Agency (USEPA)	(In-Person)
Siamak	Esfandiary	FEMA	(in-Person)
Claudia	Hoeft	U.S. Dept. of Agriculture, Natural Resources Conservation Service (NRCS)	(In-Person)
Victor	Hom	NOAA / National Weather Service	(In-Person)
Sam	Lin	Federal Energy Regulatory Commission (FERC)	(In-Person)
Benjamin	Pratt	National Hydrologic Warning Council (NHWC)	(In-Person)
David	Raff	U.S. Army Corps of Engineers (USACE)	(In-Person)
Thomas	Nicholson	Nuclear Regulatory Commission	(In-Person)
Robert	Mason	U.S. Geological Survey (USGS)	(In-Person)
David	Wells	US Environmental Protection Agency (USEPA)	(In-Person)
Shaun	Wicklein	USGS	(in Person)
Jeff	Arnold	USACE	(Phone)
Martin	Becker	Becker	(phone)
Bill	Campbell	Applied Weather Consultants	(phone)
Lichuan	Chen	NOAA	(phone)

Doug	Clemetson	U.S. Army Corps of Engineers (USACE)	(phone)
Jerry	Coffee	Formerly OMB	(phone)
Melissa	Collard	CA Division of Water Resources	(phone)
Ian	Ferguson	U.S. Bureau of Reclamation	(phone)
Larisa	Ford	U.S. Bureau of Land Management (USBLM)	(phone)
Ted	Engman	NASA	(phone)
Mike	Everly	U.S. Forest Service	(phone)
David	Goodrich	U.S. Dept. of Agriculture, Agricultural Research Service (ARS)	
Ted	Ingman	NASA	(Phone)
Bill	Kappel	AWA	(phone)
Dongsoo	Kim	NOAA	(phone)
Lee	Koss	U.S. Bureau of Land Management (USBLM)	(phone)
Quan	Quan	U.S. Dept. of Agriculture, Natural Resources Conservation Service (NRCS)	(phone)
Chandra	Pathak	U.S. Army Corps of Engineers (USACE)	(phone)
William	Merkel	U.S. Dept. of Agriculture, Natural Resources Conservation Service (NRCS)	(phone)

Tom	Roberts	VA DCR Dam Safety	(phone)
Dave	Sutley	FEMA Region 8	(phone)
Will	Thomas	Association of State Flood Plain Managers (ASFPM)	(phone)

Attachment 2. USGS Business Report for May Meeting of SOH

First USGS streamgage turns 125 years old

The first USGS streamgage, the Rio Grande at Embudo, New Mexico, just turned 125 years old, and the U.S. Geological Survey and many partner agencies commemorated the event on April 22. Note only was Embudo the first USGS streamgage, it was the location for Camp Embudo, the location where early hydrographers worked out the basics of the streamgaging process (URL: <http://pubs.usgs.gov/fs/2014/3034/>).

Situated 43 miles from Santa Fe, NM, Embudo was selected as the site of the first streamgage because it offered a favorable winter climate and easy rail access, an important consideration for transporting the personnel and scientific and camp equipment needed at the camp, while qualifying for congressional funding tapped specifically for the “arid West”.

At the close of the commemoration USGS hydrographers demonstrated various new equipment and techniques now used or under development by the USGS. The equipment includes the acoustic Doppler current profiler (ADCP) mounted on remotely controlled boats and experimental radar for indexing streamflow as a function of surface velocity.

USGS releases new PeakFQ

The USGS released the latest version of PeakFQ Version 7.1. This release implements both the existing Bulletin 17B procedures and new procedures proposed by the Advisory Committee on Water Information (ACWI), Subcommittee on Hydrology (SOH), Hydrologic Frequency Analysis Work Group (HFAWG). These proposed changes include use of the Expected Moments Algorithm (EMA) generalized method-of-moments estimator (Cohn and others, 1997) and a generalized version of the Grubbs-Beck test for low outliers (Cohn and others, 2013.) See below for links to pages containing the PeakFQ program, Frequently Asked Questions (FAQ), and a Fact Sheet and additional publications.

Item	Description
PeakFQ V 7.1	Program compiled for Windows 7/8 http://water.usgs.gov/software/PeakFQ/
FAQ	Determining Flood Frequency Using EMA in PeakFQ http://acwi.gov/hydrology/Frequency/b17_swfaq/EMAFAQ.html
Fact Sheet	Veilleux, A.G., Cohn, T.A., Flynn, K.M., Mason, R.R., Jr., and Hummel, P.R., 2014, Estimating magnitude and frequency of floods using the PeakFQ 7.0 program: U.S. Geological Survey Fact Sheet 2013-3108, 2 p. http://dx.doi.org/10.3133/fs20133108

Bulletin 17B	Interagency Advisory Committee on Water Data, 1982, Guidelines for determining flood-flow frequency: Bulletin 17B of the Hydrology Subcommittee, Office of Water Data Coordination, U.S. Geological Survey, Reston, Va., 183 p. http://water.usgs.gov/osw/bulletin17b/bulletin_17B.html
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Cohn, T.A., England, J.F., Berenbrock, C.E., Mason, R.R., Stedinger, J.R., and Lamontagne, J.R., 2013, A generalized Grubbs-Beck test statistic for detecting multiple potentially influential low outliers in flood series: *Water Resources Research*, v. 49, no. 8, p. 5047–5058.

Cohn, T.A., Lane, W.L., and Baier, W.G., 1997, An algorithm for computing moments-based flood quantile estimates when historical flood information is available: *Water Resources Research*, v. 33, no. 9, p. 2089–2096.

Attachment 3. -Hydrologic Frequency Analysis Work Group (HFAWG) report to the Subcommittee on Hydrology (SOH) for the May 1, 2014 meeting

The Hydrologic Frequency Analysis Work Group (HFAWG) is updating Bulletin 17B, *Guidelines For Determining Flood Flow Frequency*, dated March 1982, to include new statistical procedures, namely:

- The Expected Moments Algorithm (EMA), and
- A new Multiple Grubbs-Beck (MGB) test.

A subgroup of the HFAWG applied the new statistical procedures to observed and simulated data and compared estimated flood discharges from the new procedures to estimates from the Bulletin 17B procedures. Those test results are summarized in a report "Evaluation of Recommended Revisions to Bulletin 17B". This report has been revised a few times and the latest version, dated April 29, 2014, was provided to HFAWG members today for their review and comment. The U.S. Geological Survey (USGS) will publish this report and it is now in colleague review within USGS. This report provides the background and justification for implementing the new statistical procedures (EMA/MGB).

USGS has implemented the new statistical procedures in their PeakFQ flood frequency computer program. Version 7.1 of the PeakFQ program has been completed and is posted on the USGS software page at <http://water.usgs.gov/software/PeakFQ/>. There is a Fact Sheet on the web site that briefly describes PeakFQ Version 7.1. USGS has also prepared some Frequently Asked Questions (FAQs) about the new statistical procedures and there is a link to the FAQs that are posted on the HFAWG web site at http://acwi.gov/hydrology/Frequency/b17_swfaq/EMAFAQ.html. More FAQs will be added in the future as the need arises.

The HFAWG is drafting Bulletin 17C, a revised version of Bulletin 17B. The tentative plan is to publish Bulletin 17C as an USGS Circular with individual authors following the example of USGS Circular 1331, *Climate Change and Water Resources Management: A Federal Perspective* (<http://pubs.usgs.gov/circ/1331/>). The Bureau of Reclamation, U.S. Army Corps of Engineers, and the USGS are leading this effort with technical support from Cornell University. This approach is recommended because the SOH does not have a publication mechanism. Does the SOH agree that the USGS Circular series a reasonable and acceptable approach for publishing Bulletin 17C?

Will Thomas
Chair, HFAWG
Michael Baker International
April 30, 2014

Attachment 4 -Extreme Storm Event Work Group (ESEWG) Quarterly Report

The ESEWG has developed and scheduled a “Workshop to Define Needed Extreme Storm Products and Associated Resources” for May 15 -16, 2014 at U.S. Nuclear Regulatory Commission (U.S. NRC), Office of Nuclear Regulatory Research, Room 6B1, 21 Church Street, Rockville, MD (adjacent to the Rockville METRO Station) (please see attached Workshop Program for details). The workshop objectives are to: (1) clearly define extreme storm products that are needed for deterministic and risk-informed infrastructure decision making by Federal agencies, now and in the future; (2) prepare a statement describing the products and their priority; and (3) formulate a proposal to SOH/ACWI with the schedules and costs to create the products, and to define the methods of coordination amongst Federal agencies to accomplish Objectives 1 and 2 in the proposal.

The workshop goals are to:

- Refine the extreme storm information and methodology needs of each Federal agency that participates in the ESEWG of the SOH.
- Develop a description of extreme storm products that would meet these needs and consider the needs of States.
- Estimate the costs involved to develop the products (Identify funding requirements).
- Prioritize the order of development of the products.
- Identify contributions to products by each Federal agency and their respective roles (technical, financial, peer review, etc.).
- Identify potential modes of coordination and governance for this proposal.

To develop the needed background information for the workshop, the ESEWG developed and sent to the SOH Chair and Vice-Chair a questionnaire for distribution to the Federal Agencies (please see attachment 1 to the Workshop Program), and a separate questionnaire for the States (please see attachment 2). These questionnaires asks each Federal Agency and relevant State Agency to critically evaluate their views, methods, data sources, tools, etc. regarding extreme storm events and to identify any needs and/or gaps in extreme storm event information. In the Workshop scheduled for May 15 -16, 2014, the respondents will present their identified needs. The answers to the questionnaires will be synthesized to define extreme storm products that are needed for deterministic and risk-informed infrastructure design. The products and corresponding schedules and costs will be presented in a proposal to ACWI-SOH.

The ESEWG Chair attended and presented with the SOH Chair, a discussion of the Workshop and questionnaire to the Interagency Committee on Dam Safety (ICODS)/ National Dam Safety Review Board (NDSRB) at their quarterly meeting held at FERC headquarters on April 24, 2014. The State representatives were very enthusiastic about the SOH and ESEWG presentation, and expressed interest in the Workshop and questionnaire.

To finalize the Workshop Program and review the questionnaire responses, the ESEWG will have a teleconference on Thursday, May 8, 2014 @2:00 p.m. EDST. The latest draft of the Workshop Program which is attached to this report will be reviewed and possibly revised.

I wish to acknowledge the cooperative and diligent work of the ESEWG members in developing the Workshop Program and questionnaires, especially the extensive efforts of Victoria Sankovich-Bahls, Bureau of Reclamation and Mark Perry, State of Colorado.

If you have any questions or comments, please comment Tom Nicholson @ Thomas.Nicholson@nrc.gov.