

Subcommittee on Hydrology (SOH)

Report on 2017 Activities and Accomplishments

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Subcommittee On Hydrology

Purpose

Improve the availability and reliability of surface-water quantity information needed for hazard mitigation, water supply and demand management, and environmental protection.

Activities

Quarterly Meetings, Workgroups, Workgroup Meetings, Announcements, Conferences.

Website

<http://acwi.gov/hydrology/index.html>



<http://acwi.gov>

- **Water Information Coordination Program**
The WICP ensures collaborative efforts among Federal Agencies to improve water information for decision-making about natural resources management and environmental protection.
- **Advisory Committee on Water Information**
The ACWI represents the interests of water-information users and professionals in advising the Federal Government on Federal water-information programs and their effectiveness in meeting the Nation's water-information needs.

SOH Member Organizations

1. Agricultural Research Service (ARS)
2. Association of State Floodplain Managers (ASFPM)
3. BECKER
4. Bureau of Land Management (BLM)
5. Bureau of Reclamation (USBR)
6. Environmental Protection Agency (EPA)
7. Federal Emergency Management Agency (FEMA)
8. Federal Energy Regulatory Commission (FERC)
9. Federal Highway Administration (FHWA)
10. Forest Service (USFS)
11. National Aeronautics and Space Administration (NASA)
12. National Hydrologic Warning Council (NHWC)
13. National Science Foundation (NSF)
14. Natural Resources Conservation Service (NRCS)
15. NOAA National Weather Service (NWS)
16. Nuclear Regulatory Commission (NRC)
17. Office of Surface Mining (OSMRE)
18. Tennessee Valley Authority
19. U.S. Army Corps of Engineers (USACE)
20. United States Geological Survey (USGS)

SOH Workgroups

- Hydrologic Frequency Analysis Work Group (HFAWG)
- Extreme Storm Events Work Group (ESEWG)
- Hydrologic Modeling Work Group (HMWG)
- Satellite Telemetry Interagency Work Group (STIWG)
- Proposed Streamflow Information Collaborative
- Proposed workgroup on filling “data gaps”

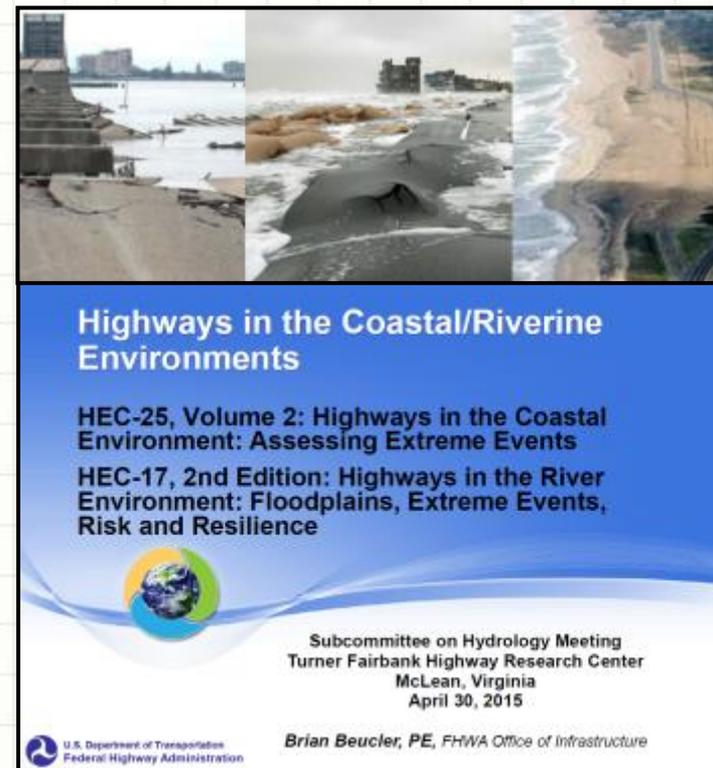
SOH Quarterly Meeting

- Quarterly Meetings hosted by Member Agencies
- Participation by Senior Officials, Advisors, Staff of the Host Agency, SOH Members, and Guests
- Formal Presentation on a Topic of Mutual Interest
- SOH Review of Workgroup Activities
- Member Agency Reports
- Cross collaboration with other ACWI Subcommittees



List of Past Feature Presentations

- [Guidelines for Determining Flood Flow Frequency Bulletin 17C](#)
- [FHWA -Highways in the Coastal/Riverine Environments](#)
- [NASA -Earth Observation Systems for Hydrology](#)
- [NOAA -National Climatic Data Center](#)
- [USGS -Streamgaging](#)
- [FEMA -Impact of Climate Change and Population Growth on the National Flood Insurance Program](#)
- [USACE -Engineering Guidance Frame Work for Inland Hydrology Considering Climate Change](#)
- [Climate Change Adaptation and Water Resources](#)
- [USDA -National Dam Safety Program and Hydrologic Needs](#)



<http://acwi.gov/hydrology/minutes/index.html>

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SOH Satellite Telemetry Interagency Workgroup (STIWG)

LySanias Broyles, Chair US Army Corps of Engineers (USACE)

Summary:

- Last meeting: 08-Nov-2017
- New GOES-E satellite operational (Dec 2017)
 - Higher resolution and more accurate forecasts
 - HRIT (replacing LRIT)
 - Proposed new HRIT file format: more statistics and reduce overhead
- GOES-S to launch 01-Mar-2018 to replace GOES-W
- Migration from DOMSAT (to L/HRIT - service ends 2019)
- CS2 Transition: Utilize bandwidth savings for new channels to meet user requirements
- Preserve the GOES radio spectrum
- Standardize OpenDCS software
- Looking forward to 2-way DCP's

DCS Preservation Subcommittee

- Remain engaged in effort to preserve the DCS 1675 - 1695 MHz allocation
- Amend STIWG DCS Reliance and Preservation whitepaper as living document
 - Include role of DCS in the context of noteworthy events (flood, drought, fire, hurricane, earthquake, etc.)
- Engage agency Interdepartment Radio Advisory Committee (IRAC) members
 - Accurate portrayal of DCS system relative to spectrum sharing proposals
- Pursue opportunities to educate public about GOES DCS
 - Promote responsible spectrum allocation to preserve existing critical communication systems
 - Emphasize the growing number GOES transmitting platforms
 - Illustrate the consequences of interference to ground stations by terrestrial radio towers
 - Underscore the internet is the transport medium; not the source of hydro-met data
 - Known cases of service degradation and suspension of wireless infrastructure projects due to interference to other allocations of the radio spectrum (e.g. GPS ground stations)

Open DCS Standardization

- OpenDCS is software used by STIWG agencies to collect, decode, validate, transform, and disseminate data from deployed Data Collection Platforms (DCP's); primarily via GOES DCS
- Combine existing OpenDCS variants into a single jointly supported STIWG version
- End-to-end coordination of data from source to processing
 - Both Cove and Sutron have agreed to support the unified platform
 - Improve scope of enhancements
 - Ensure compatibility
 - Reduce re-work
 - Share cost of OpenDCS support
- Interagency Agreements
 - Funding mechanism for supporting and enhancing OpenDCS
 - Based on existing agreements between USACE and STIWG agencies
 - NOAA agreement currently being reviewed before release
 - Other interagency agreements will follow

2018 TWG/STIWG

- Annual joint meeting scheduled for March 2018

SOH Hydrologic Modeling Workgroup (HMWG)

- Jerry Webb, Chair US Army Corp of Engineers (USACE)
- Claudia Hoeft, Technical Chair 5th FIHMC, (USDA NRCS)

Purpose, Goals, and Accomplishments:

- ❑ Promote sharing of information on modeling tools and modeling systems in hydrology and water resources.
- ❑ Plans, organizes, and promotes the Federal Interagency Hydrologic Modeling Conference every four/five years and
- ❑ Engages in other modeling related activities as appropriate.
- ❑ Held the 15th Federal SED-HYD Conference 4/19-23, 2015
 - ❑ 350 people attended; 240 tech papers and extended abstracts were presented. 11 short courses

SOH Extreme Storm Events Workgroup (ESEWG)

- **Thomas J. Nicholson, Chair** U.S. Nuclear Regulatory Commission (USNRC)
- **William Otero, Vice-Chair** U.S. Army Corps of Engineers (USACE)

Purpose and Goals:

- Coordinate studies and databases for reviewing and improving methodologies and data collection techniques used to develop design precipitation estimates of large storm events up to and including the Probable Maximum Precipitation (PMP).
- Develop a detailed scope of work/plan of study, and
- Determine the necessary funding requirements to update the Catalog of Extreme Storms and Hydrometeorological Reports (HMR) for estimating PMP.

SOH Extreme Storm Events Workgroup (ESEWG)

Products:

Workshop to Define Needed Extreme Precipitation Products held at NOAA, Silver Spring, MD

[Workshop Synthesis Report](#) (with Appendices)

[Appendix A](#) - Federal Agency Questionnaire for Needs in Extreme Precipitation

[Appendix B](#) - Summary of Questionnaire Responses by Federal Agencies

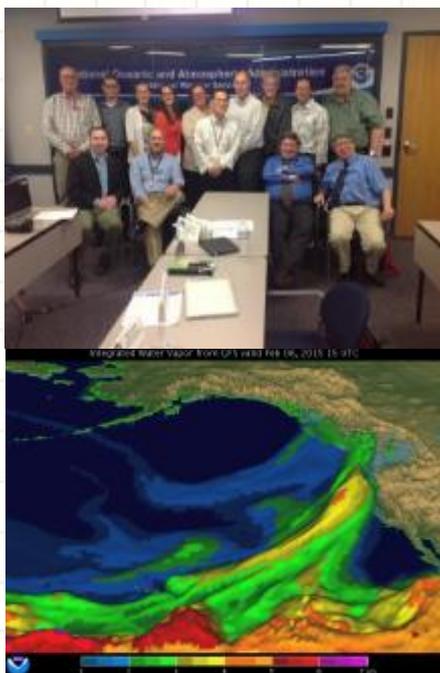
[Appendix C](#) - State Dam Safety Agency Questionnaire

[Appendix D](#) - Summary of Questionnaire Responses by State Dam Safety Agencies

[Appendix E](#) - Program and Agenda

[Appendix F](#) - Attendees

[Appendix G](#) - Presentations from the Federal and State Agencies



➤ See proceedings: <https://acwi.gov/hydrology/extreme-storm/minutes/index.html>

SOH Extreme Storm Events Workgroup (ESEWG)

Recommendations from Scientists, Regulatory Agencies and Dam Owners including 21 States and 8 Federal Agencies to address Precipitation Data Needs

ESEWG Established a Proposal Writing Team (PWT) to Document the Identified Needs National Proposal on Extreme Rainfall Product Needs

- *Began with responses to questionnaires from SOH Federal, State agencies, and member organizations of the ICODS and NDSRB on their use of extreme storm data, products and services to determine needs and priorities*
- *ESEWG Proposal Writing Team (PWT) met periodically to develop technical bases for the recommended needs and products within the current Federal and State programs*
- *Draft Proposal to be shared and discussed with entire ESEWG in February 2018*
- *Significant needs exist for Updating HMRs and Completing NOAA Atlas 14 for use by dam safety and nuclear regulators*
- *Dedicated annual budgets needed to support the identified product needs*

SOH Extreme Storm Events Workgroup (ESEWG)

Ongoing discussions to finalize Proposal recommendations:

- Need to update NOAA Hydrometeorological Reports (HMRs) using recent extreme storm data - particularly HMRs 49, 51, 52, 55A, 57, 59 with dedicated annual budgets
- Consider whether HMRs should be withdrawn if not updated, however the Dam Safety community relies upon the guidance from the HMRs regarding the design and maintenance of those structures

SOH Extreme Storm Events Workgroup (ESEWG) Recommendation Discussions (continued)

- Complete extension of NOAA Atlas 14 to cover the remaining five northwestern U.S. States
- Develop an enhanced suite of products for the U.S. simultaneously using improved methodology capable of accounting for the non-stationary climate
- Complete and update NOAA Atlas 14 with a dedicated annual budget
- Configure NOAA Atlas 14 to watershed boundaries and not State boundaries for both short and long durations

SOH Extreme Storm Events Workgroup (ESEWG) Recommendation Discussions (continued)

- Analyze Hurricane and Extratropical Cyclone data related to severe flooding (e.g., Hurricanes Harvey and Maria; Missouri 2017 storm)
http://www.nws.noaa.gov/oh/hdsc/aep_storm_analysis/index.html
- Develop guidance for Federal and State agencies in their review of State-Wide and Site-Specific PMP Estimates (e.g., share lessons learned from technical reviews of industry Site-Specific PMP studies)
- Support completion and sharing of the U.S. Extreme Precipitation Database for Flood Assessments including an archive of Quality Controlled hourly precipitation estimates used in the studies

Recommendations from Workshops and Meetings with Stakeholders

1. Coordinate Studies and Database

- Maintain and post active list of Extreme Storms Studies (such as PMP studies)
- Develop National repository for precipitation data collected by Workgroup organizations and foster data agreement with respective agencies.

2. Develop a detailed scope of work/plan of study

- Work with the ESEWG Proposal Writing Team (PWT) to complete detailed scope of work/plan of study

3. Determine necessary funding requirements to pursue rainfall product needs

- Next step is to present proposal with funding needs to SOH and then onto ACWI
- Focus should be on highest priority needs to include guidance and shared databases for regional and site-specific PMP estimates; and for Probabilistic Flood Hazard Assessments.

SOH Hydrologic Frequency Analysis Workgroup (HFAWG)

- **Will Thomas, Chair**, Michael Baker International/ASFPM
- **John England, Vice-Chair**, US Army Corps of Engineers (USACE)

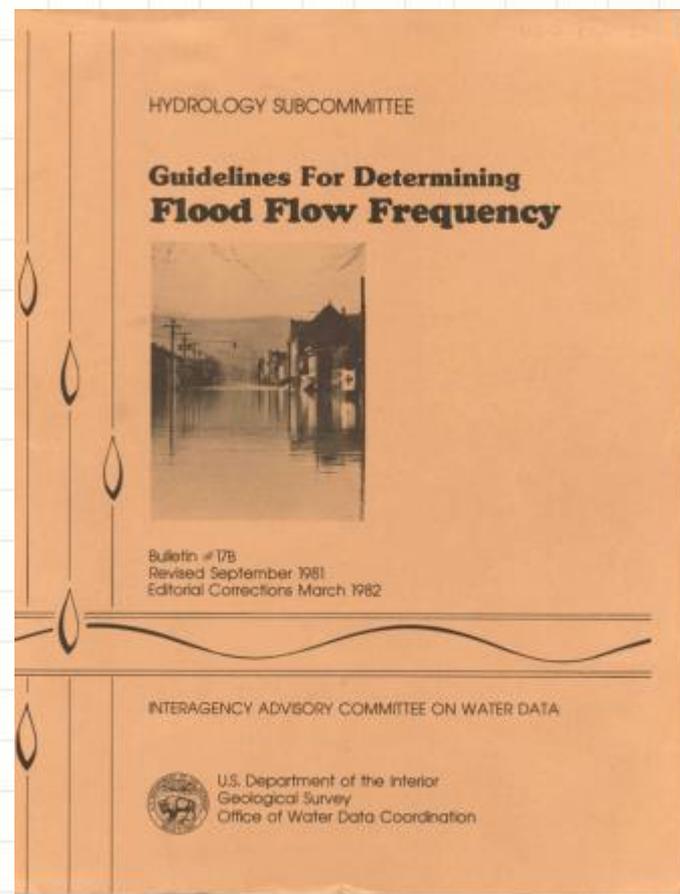
Purpose and Goals:

- recommend procedures to increase the usefulness of the current guidelines for Hydrologic Frequency Analysis computations,
- evaluate other procedures for frequency analysis of hydrologic phenomena, and
- forward draft papers and recommendations to the Subcommittee on Hydrology of ACWI for appropriate action.

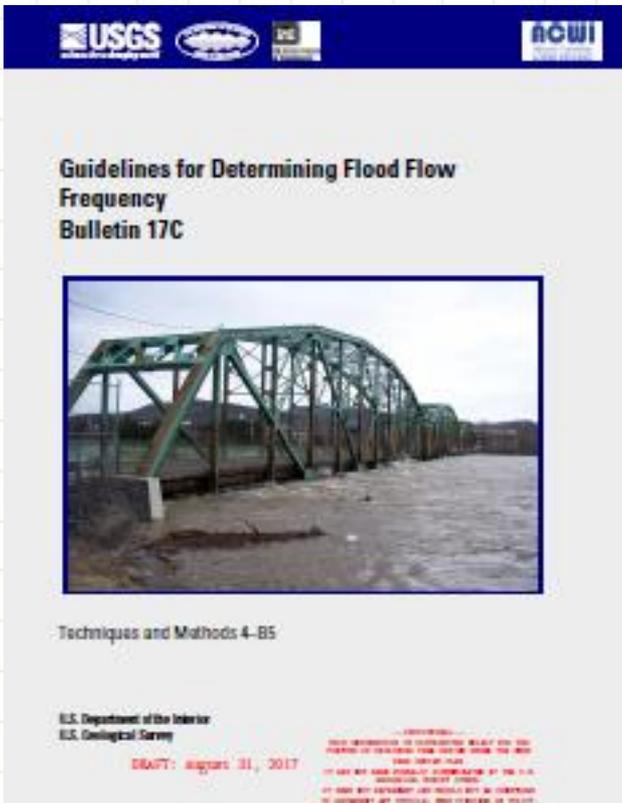
SOH Hydrologic Frequency Analysis Workgroup (HFAWG)

Updated Bulletin 17B Guidelines:

- Published in March 1982, based on research from 1960s and 1970s
- HFAWG has updated Bulletin 17B using pertinent research since 1982
- Incorporated new statistical procedures for analyzing historical floods and nonstandard flood data and adjusting for low floods
- http://water.usgs.gov/osw/bulletin17b/bulletin_17B.html



SOH Hydrologic Frequency Analysis Workgroup (HFAWG)



New Guidelines for Determining Flood Flow Frequency - Bulletin 17C

Major Improvements

1. *Better Use of Historical Information, Interval Data and Low and Zero flows*
2. *Low Floods (Outlier) Identification*
3. *More Accurate Confidence Intervals*
4. *Procedure for Estimation of Regional Skew*
5. *Plotting Positions with multiple thresholds*
6. *New Statement on Climate Change*
7. *Deletion of Expected Probability*

SOH Hydrologic Frequency Analysis Workgroup (HFAWG)

- Bulletin 17C, to be published by USGS, is considered “highly influential science” and a Communication Plan was prepared that describes:
 - Subject and purpose of the publication
 - Impact of dissemination
 - Details on the USGS review process and requisite experience of the peer reviewers
- Final version of Bulletin 17C and supporting materials and software links are posted on the SOH/HFAWG web site (<https://acwi.gov/hydrology/Frequency/b17c/>)

SOH Hydrologic Frequency Analysis Workgroup (HFAWG)

Progress since February 2017 ACWI meeting

- May-June 2017 – Conducted test on the reproducibility of Bulletin 17C, eight testers analyzed four data sets and got very similar results
- September 21, 2017 – SOH approved the August 2017 version of Bulletin 17C for publication
- September 26, 2017 – USGS approved publication of Bulletin 17C as Techniques and Methods 4-B5
- January 2018 – Report status of Bulletin 17C to the ACWI

SOH Hydrologic Frequency Analysis Workgroup (HFAWG)

- **The Path Forward**
 - USGS to publish Bulletin 17C as Techniques and Methods 4-B5
 - Software, examples, and training materials posted on the HFAWG web site will be revised as needed
 - Training courses will be offered through Federal agencies and technical conferences
 - Additional outreach through presentations at technical conferences such as the National Hydrologic Warning Council and Association of State Floodplain Managers

Streamflow Information Collaborative Work Group Update

GOALS:

- Coordinate USGS National Streamflow Network priorities.
- Identify opportunities for coordination, innovation, technical transfer, training, and leveraging of resources (including foundational datasets, data management systems, and scientific tools).
- Create cohesive strategies which address the value, uses, economic benefits, and critical gaps in our Nation's streamflow network.

Streamflow Information Collaborative Work Group Update – (cont.)

- Increase engagement and knowledge with the data partners and stakeholders of streamflow information.
- Develop effective mechanisms to “get the word out” (telling “our” story” (web portal, social media)).
- Develop issues for future priorities:
 - estimation of flows at unengaged streams
 - quantifying errors and uncertainty
- Develop recommendations for future SOH consideration in supporting the national streamflow information network.

Streamflow Information Collaborative Activities in 2017

- Approximate Monthly Conference Calls since May 2016 except for June to October 2017
 - Using the NSN to estimate streamflow at Ungaged Locations – Julie Kiang, USGS
 - National Groundwater Monitoring Network – Bill Cunningham, USGS
 - National Water and Climate Center Snow Survey and Water Supply Forecasting Program and SCAN – Claudia Hoeft, NRCS
 - Examples of other data collected at Streamgages – Doug Yeskis, USGS

Streamflow Information Collaborative Activities in 2017 (cont.)

- Finalization of Streamflow Information Collaborative Charter
- Co-Chair is Ryan Mueller (IN DNR)
- New Acting GWSIP Program Coordinator (Mike Woodside)

Proposal for a Working Group on observational needs and filling data gaps

- To report on the current procedures for dealing with missing or non-existent spatial and temporal hydrologic data.
- To identify and describe potential new technologies for dealing with missing data.

Proposal for a Working Group on observational needs and filling data gaps, report outline.

- Comprehensive description of the problem
- Literature review, not comprehensive
- Description of procedures currently used by agencies, consultants, etc..
- Identify new technologies
- List of selected references
- Summary and recommendations

Questions?