Minutes of the May 16, 2018 Meeting of the ESEWG

A meeting of the Extreme Storm Events Work Group (ESEWG) was held in Room 8246 of the National Weather Service (NWS) / NOAA Headquarters in Silver Spring, Maryland at 1:00 p.m. EDST on Wednesday, May 16, 2018. Dr. Sanja Perica, Chief, Hydrometeorological Design Studies Center, Office of Water Prediction, NWS/NOAA was the meeting host. Many of the ESEWG members attended remotely via teleconference.

The meeting objectives were to: (1) discuss the May 15, 2018 draft of the "Extreme Rainfall Product Needs Proposal" (i.e., draft Proposal); and (2) vote on accepting the draft Proposal and sending it to the Subcommittee on Hydrology (SOH) for their consideration and forwarding to the Advisory Committee on Water Information (ACWI).

Tom Nicholson, ESEWG Chair, opened the teleconference with introductions and review of the agenda (please see attached agenda).

The meeting attendees were:

- ✓ Thomas Nicholson, ESEWG Chair, Senior Technical Advisor, U.S. NRC
- ✓ Sanja Perica, Chief, Hydrometeorological Design Studies Center, NWS/NOAA
- ✓ William Otero, U.S. Army Corps of Engineers (USACE) – Kansas City, ESEWG Vice-Chair and Leader of the Proposal Writing Team
- ✓ Mark Perry, State of Colorado Dam Safety
- ✓ Marian Baker, NWS/NOAA
- ✓ William Asquith, USGS – Lubbock, TX
- ✓ Bill Kappel, Applied Weather Associates (AWA)
- ✓ Doug Hultstrand, AWA
- ✓ Joseph Kanney, U.S. NRC
- ✓ Chuck McWilliams, USACE – Omaha
- ✓ George Hayes, USACE – Omaha
- ✓ Brian Nelson, NOAA/National Centers for Environmental Information (NCEI) – Asheville, NC
- ✓ Chandra Pathak, USACE – Headquarters
- ✓ Kevin Quinlan, U.S. NRC

As background, Tom Nicholson reviewed the history of the draft Proposal. He mentioned the posting of the "***Proceedings of the 2014 Workshop to Define Extreme Precipitation Product Needs"*** referenced in the draft Proposal (please see https://acwi.gov/hydrology/extreme-storm/) as a "Product" of the ESEWG. This posting provides citable information sources in the "***Workshop Synthesis Report with Appendices***" and its presentations. This detailed information is on the SOH Website as "***Extreme Storm Events – Minutes***" at: https://acwi.gov/hydrology/extreme-storm/minutes/index.html.

Tom introduced William Otero, Leader of the Proposal Writing Team, who provided an overview of draft Proposal on Extreme Rainfall Product Needs. He discussed the Executive Summary and the focus on three product needs:

- NOAA Atlas 14 Completion and Future Updates,
- U.S. Extreme Precipitation Database, and
- Updated Probable Maximum Precipitation Estimates.

Each product need is documented as a separate chapter in the draft Proposal. William introduced Dr. Sanja Perica, NWS/NOAA who authored Chapter 2 “NOAA Atlas 14 Updates and Upgrades.” She discussed the tasks needed to complete and improve NOAA Atlas 14:

- Complete NOAA Atlas 14 for the Northwestern USA (i.e., Washington, Oregon, Idaho and western Montana);

- Update the whole country simultaneously using improved methodology capable of accounting for the nonstationary climate; and

- Enhance NOAA Atlas 14 products’ suite {i.e., Areal reduction factors (ARFs), design storms, variable confidence limits}.

Marian Baker, Chuck McWilliams and George Hayes discussed Chapter 3 “U.S. Extreme Storm Database” being developed and implemented by the USACE. USACE is developing the Extreme Storm Database (ESD) to digitally archive pertinent data of the storms contained in the Extreme Storm Catalog, as well as from additional storms that have occurred since 1973 (e.g., Hurricanes Sandy and Harvey) resulting in significant flooding with an emphasis on storing data for events that occurred in the proximity of USACE projects.

As stated in the draft Proposal, “The modern analysis will include the supporting meteorological data for the event, collected from observations surrounding the storm location downloaded from the National Centers for Environmental Information (NCEI). The design of the EPD archive of storm information will allow the user to confirm the original data for each storm event, or for users to create their own new storm analysis.”

Tasks needed to develop this storm archive system include:

- Compiling historic data for extreme storms from the NWS, USBR, USACE, State climatologists, and other agencies; updating the extreme storm catalog to include extreme storms that have occurred since 1973.
- Scanning historical files and reports, and digitizing the isohyetal maps. In addition to the historical isohyetal maps, detailed storm analysis of exceptional storms based on RFC multisensory radar precipitation estimates will be included in the database dating from the late 1990s to the present.

- Developing a website to provide a centralized location for sharing extreme storm information between all agencies as well as the public. The web site will also include electronic versions of the HMRs, site-specific PMP studies, and other pertinent references for extreme storm studies that will be available for download. The layout, format, and location of this website for long term maintenance will be developed by the ESEWG.

Chuck McWilliams and George Hayes discussed plans for the future incorporation of the ESD with HEC–MetVue and its linking to the HEC–HMS models. ESD is going through development and implementation using recent extreme precipitation storms such as Hurricanes Sandy and Harvey. Once the ESD has been successfully tested, other Federal agencies will be consulted to determine their interest in its use, pending approval of USACE leadership and implementation of sufficient security features with regard to DOE IT regulations. Tasks to be completed for the USACE Extreme Precipitation database creation and its hosting include:

- Database modifications,
- Process recent storms,
- Populate extreme storms database,
- Scan and upload storm studies,
- Test the database and link the database to HEC–MetVue,
- Move database to permanent location,
- Long-term maintenance and storm processing, and
- Develop plan for future storms.

Since John Onderdonk and Ken Fearon, FERC, were not able to attend due a conflicting event, Mark Perry, State of Colorado Dam Safety discussed Chapter 4 "Updated Probable Maximum Precipitation Estimates." Mark mentioned the State responses from the 2014 Survey which were discussed at the May 2014 Workshop and its recommendations. The draft Proposal states:

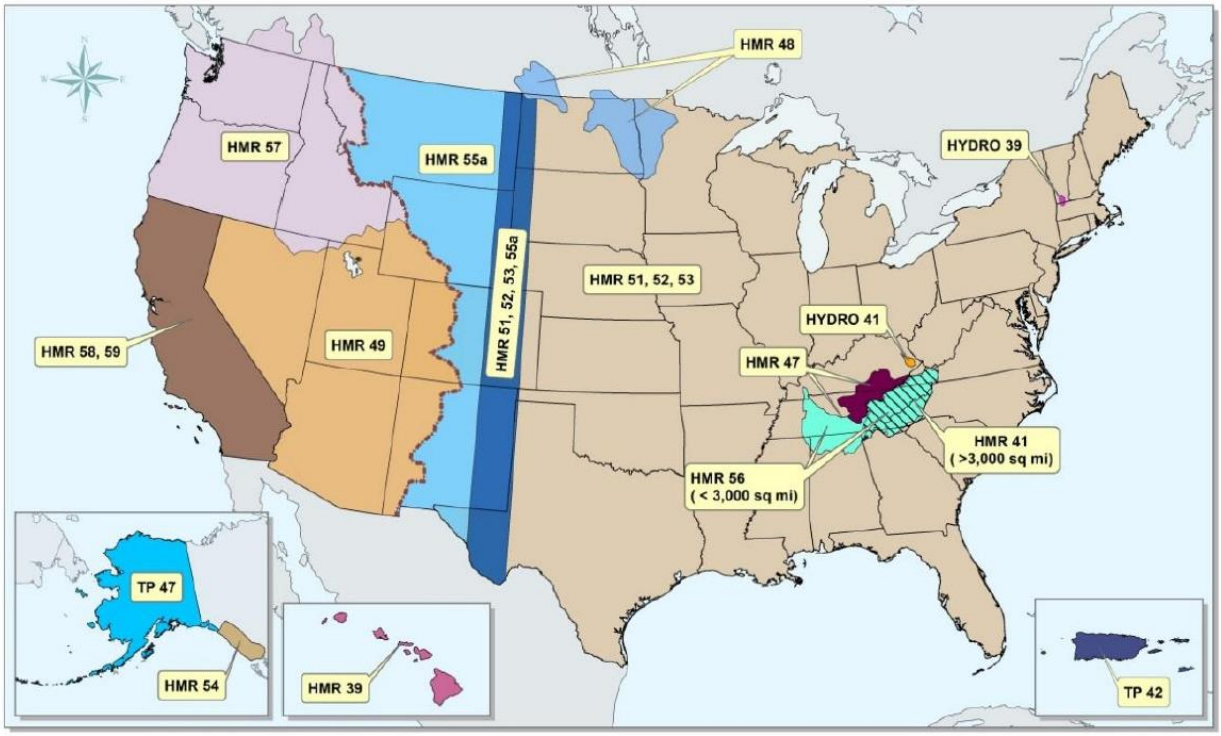
- PMP estimates are very important to the States; in most cases State spillway sizing regulations are based on a HMR PMP. In some cases the requirement for States to use HMR PMP is codified in State statutes and regulations. Around the year 2000, NOAA decided to no longer support HMR PMP products, leaving the States in a difficult situation.
- Extreme precipitation products should consider workloads of State dam safety agencies, which are typically hundreds of dams per staff member. Detailed site-specific hydrometeorological studies for each dam are simply not practical.
- States would benefit from using PMP estimates that are technically and politically defensible to private dam owners and state legislators. Currently HMRs developed in the 1970s and 1980s are difficult for States to defend while trying to enforce spillway safety regulations that could cost dam owners millions of dollars in modifications.
- National extreme precipitation products and guidelines would be good for the dam safety industry, and are needed to provide water resources developers with the confidence needed to invest in multi-million dollar infrastructure projects.
- The importance of updated PMP estimates is urgent. In some States, the level of opposition to use outdated and unsupported NOAA HMR PMP has risen to the political level, with one State legislature requiring an updated statewide PMP study, which has been recently completed. Another State dam safety agency has had a de facto moratorium on spillway evaluations at high elevations due to concerns about accuracy of HMR PMP estimates. At least eight States have moved forward with their own PMP update studies in the absence of Federal action, and many more States are considering such studies.

It was noted that in the absence of updated HMRs, many water development projects have moved forward using "site-specific PMP" (SSPMP) studies, which are basin-scale meteorological studies, typically performed by private meteorological consultants. Many States have commissioned state-wide PMP studies. Examples include the recent Colorado– New Mexico PMP study. This increase in SSPMP studies has put a burden on regulatory agencies, which often do not have the expertise or resources to review meteorological studies. SSPMP analyses generally follow the guidance of the HMRs, but deviations from the set procedures are common.

The proposal identifies three sets of tasks to meet the third product need: (1) ***HMR PMP updates;*** (2) ***Development of a national guidance document for Statewide/Regional and Site-Specific PMP Studies;*** and (3) ***PMP Ongoing Maintenance, Updates, and Research and Development.***

For the first sub-topical need, ***HMR PMP Updates***, the tasks would be:

- Update HMR PMP for HMR 51/52 study area (including HMRs 41, 27, 48 and 56 which lie within the larger HMR 51/52 boundaries);
- Update HMR 49 study area (please see U.S. map below);
- Update HMR 55A study area;
- Update HMR 39 (Hawaii) and HMR 54/TP47 (Alaska) study area;
- Update HMR 57 -59 study area.



Map of the regions covered by various National Weather Service Probable Maximum Precipitation products (National Weather Service, 2017)

For the second sub-topical need, ***Development of a national guidance document for Statewide/Regional and Site-Specific PMP Studies,*** the tasks are:

- FEMA-led expert committee to review and edit the Colorado–New Mexico Regional Extreme Precipitation Study (REPS) standard-of-practice report in order to meet the needs of a national audience;
- Review by National Dam Safety Review Board (NDSRB); and
- Publication of guidance document.

For the third sub-topical need, ***PMP Ongoing Maintenance, Updates, and Research and Development***, the tasks are:

- Coordination of HMR update methods and State/regional and site-specific PMP national guidelines;
- Compile, host and maintain HMR updates, State/regional and site-specific PMP studies;
- Perform, fund and promote PMP research and development;

- Determine criteria and frequency for review and update of PMP estimates, and perform such updates.

Following discussion on all three product needs as outlined in Chapters 2, 3 and 4, Sanja Perica made a motion to accept the draft Proposal and send it to the SOH. Marian Baker seconded the motion. The vote was unanimous by all to send the proposal forward with the edits provided by Mark Perry (submitted just prior to the meeting). William Otero mentioned that he had already incorporated Mark Perry's edits and will forward the final draft to the ESEWG members. Tom Nicholson and William Otero will send the approved draft Proposal with a note to Siamak Esfandiary, FEMA and SOH Chair and Sujay Kumar, NASA and SOH Vice-Chair prior to the next SOH meeting scheduled for July 19, 2018. Tom Nicholson will request a special SOH meeting in August to brief the SOH members and other interested parties on the submitted draft Proposal.

It was also discussed and agreed upon to have the next ESEWG meeting on August 15, 2018 to discuss quality control and quality assurance for precipitation data. Brian Nelson, NCEI and Sanja Perica, NWS/NOAA agreed to organize and conduct the meeting. Sanja Perica agreed to host the August 15, 2018 meeting at the NWS/NOAA offices in Silver Spring, MD. The meeting is scheduled for 1:00 p.m. EDST to accommodate our colleagues on the US west coast.

No action was taken to elect a new permanent chair for the ESEWG since no candidates were identified. This topic will be revisited at the August 15, 2018 ESEWG meeting.