

**RESOLUTION**  
**of the**  
**WESTERN STATES WATER COUNCIL**  
**supporting**  
**FEDERAL RESEARCH AND DEVELOPMENT OF UPDATED HYDROCLIMATE**  
**GUIDANCE FOR FLOODS & DROUGHTS**  
**Helena, Montana**  
**July 18, 2014**

**WHEREAS**, Western states continue to experience extreme flooding, droughts, or wildfires that threaten public safety, tax aging water infrastructure, and/or have significant economic consequences; and

**WHEREAS**, according to the National Oceanic and Atmospheric Administration (NOAA), the nation's top ten multi-billion dollar disasters have occurred since 1980, with six of those in the last decade; and

**WHEREAS**, we must be prepared to effectively manage for frequent, extensive, and severe storms, floods, coastal inundation, and droughts; and

**WHEREAS** Western states experienced extreme drought in 2011-2014, as well as recent floods of record in areas such as parts of the Missouri River Basin in 2011 and Colorado in 2013, and further Winter Storm Atlas in 2013; and

**WHEREAS**, key long-term observation networks needed for monitoring extreme events, such as USGS streamgages and the NWS Cooperative Observer network, face continued funding and programmatic challenges that threaten the continuity of crucial long-term data records; and

**WHEREAS**, snow water content and soil moisture monitoring are also critical for drought and flood forecasting and management, but the NRCS snow survey and water supply forecasting program, related SNOTEL sites, and its Soil Climate Analysis Network remain underfunded; and

**WHEREAS**, some of NOAA's probable maximum precipitation estimates used by water agencies for dam safety and other analyses have not been updated since the 1960s and the federal Guidelines for Determining Flood Flow Frequency Analysis (published as Bulletin 17B) have not been revised since 1981; and

**WHEREAS**, flood frequency analyses are used by public agencies at all levels of government to design and manage floodplains, and for construction of flood control and stormwater infrastructure, with Bulletin 17B still representing a default standard of engineering practice; and

**WHEREAS**, federal funding for hydrology research has waned since the 1970s-1980s, and alternative statistical methodologies for flood frequency analyses or deterministic analytical procedures are not being supported and transitioned to common engineering practice; and

**WHEREAS**, the Federal Emergency Management Agency has adopted a process for local communities to explicitly incorporate "future conditions hydrology" in the national flood insurance program's flood hazards mapping; and

**WHEREAS**, the present scientific capability for forecasting beyond the weather time domain – beyond the ten day time horizon – and at the subseasonal to interannual timescales important for water management is not skillful enough to support water management decision-making; and

**WHEREAS**, the Council has co-sponsored a number of workshops on hydroclimate data and extreme events, to identify actions that can be taken at planning to operational time scales to improve readiness for extreme events; and

**WHEREAS**, multiple approaches have been identified at these workshops that could be employed at the planning time scale, including ensembles of global circulation models, paleoclimate analyses, and improved statistical modeling, that could be used to improve flood frequency analysis or seasonal forecasting; and

**WHEREAS**, advances in weather forecasting research, such as that of NOAA's Hydrometeorological Testbed program on West Coast atmospheric rivers, demonstrate the potential for improving extreme event forecasting at the operational time scale; and

**WHEREAS**, WGA and NOAA signed a Memorandum of Agreement in June 2014 on improving resilience to droughts and floods;

**NOW, THEREFORE, BE IT RESOLVED**, that the federal government should update and revise its guidance documents for hydrologic data and methodologies – among them precipitation-frequency estimates, flood frequency analyses, and probable maximum precipitation – to include subsequently observed data and new analytical approaches.

**BE IT FURTHER RESOLVED**, that the federal government should place a priority on improving subseasonal and seasonal precipitation forecasting capability that would support water management decisions.

**BE IT FURTHER RESOLVED**, that the Western States Water Council supports development of an improved observing system for Western extreme precipitation events such as atmospheric river storms, as well as baseline and enhanced stream, snow and soil moisture monitoring capabilities.

**BE IT FURTHER RESOLVED**, that the federal government should sustain and expand its Hydrometeorology Testbed – West program, in partnership with states and regional centers, to build upon the initial progress made in that program for developing and installing new technologies for precipitation observations.

**BE IT FURTHER RESOLVED**, that the Western States Water Council urges the federal government to support and place a priority on research related to extreme events, including research on better understanding of hydroclimate processes, paleoflood analysis, design of monitoring networks, and probabilistic outlooks of climate extremes.

**BE IT FURTHER RESOLVED**, that the Western States Water Council will work with NOAA and WGA in supporting efforts on climate extremes, variability, and future trends.