

Utah PMP Studies: The Third Time's the Charm

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Determination of probable maximum precipitation (PMP) within dam engineering is critical for the design of spillways. Several hydrometeorological reports (HMR's) written by the National Weather Service have formed the basis for PMP determination in regions around the country. As the HMR's have aged, lack of updates and revisions has led states to look at alternatives for determining PMP. These new methods have included the use of technology and data not previously available as well as predictions for future changes in weather patterns. Utah lies in the geographic region covered by Hydrometeorological Report No. 49 (HMR49) published in 1977. In the early 1990's the Utah Division of Water Resources and the Utah Division of Water Rights teamed with the State Climatologist to develop and eventually adopt refinements to HMR 49 for the development of PMP for short-duration, small-area storms in Utah. The findings were published in a 1995 report and generally led to reduced PMP values across the state. With the success of the 1995 adjustments to HMR49, the Utah Division of Water Resources again teamed with the State Climatologist in the early 2000's to develop additional refinements focused on 72 hour duration storms for areas up to 5,000 square miles. The results of this partnership were published in a 2003 report. Results from both reports have been successfully utilized to develop PMP estimates for the design and construction of spillways throughout Utah over the past 17-25 years. In 2018 the Utah Division of Water Rights, Dam Safety Section returned to the partnership with the Utah State Climatologist to begin a review of the 1995 and 2003 reports and develop recommendations for updating the procedures outlined in the two reports for computing PMP. In 1995 Utah made the decision to review and update the methods used to calculate PMP in the State. In 2003 those methods were expanded to include longer storms over larger areas. In 2018 Utah once again began reviewing their method for determining PMP to further refine the process, include new data from storm events that have occurred in the past 25 years, account for changing weather patterns, and develop a new computer based application for calculating PMP values.