

Estimating the Uncertainty of the Probable Maximum Precipitation

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Abstract. Over the past few decades, estimating Probable Maximum Precipitation (PMP) has been a standard procedure for determining the design storm of the Probable Maximum Flood (PMF). These quantities are typically used for sizing hydraulic structures such as spillways of major dams. There are several methods for estimating PMP and among them is the statistical method proposed by Hershfield. Although it has been criticized, it is a useful approach in engineering practice, especially in basins lacking hydrometeorological data. In this paper we propose a method for quantifying the uncertainty associated with PMP arising from the uncertainties in estimating the mean and standard deviation of the annual maximum daily precipitation derived from limited historical samples. Furthermore, we illustrate the applicability of the proposed method using a case study of a high dam being built in South America. The proposed method has been helpful in deciding the capacity of the spillway and we expect that despite of the limitations and approximations involved the proposed method be useful in other projects elsewhere.

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