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Research Article

Estimation of the upper limit of confidence interval with the Monte Carlo method

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Abstract

The assessment of peak flows with different return period is one of the important stages during the design of hydraulic works. The best method of their assessment is the statistic method, wich consists of using a measured series of maximum annual flows (preferably as long as possible) in order to be as reliable as possible and the error as small as possible during the probabilistic interpolation. Since the uncertainty of the assessment cannot be avoided due to different factors, then with the standard error method, a confidence interval is obtained which determines the interval where the flow value with a certain return period will be located on average in 95% of cases. Another method of dealing with the uncertainty in determining the maximum flow is by using the Monte Carlo method. The assessment of peak flows using the Monte Carlo method has been applied to the case study of the Shkumbin River at the Rrogozhine measurement site.

In the conclusions presented in this article, the results of the uncertainty assessment for the maximum flow found with the standard error method and with the Monte Carlo method will be compared.

Keywords: Peak flow, Confidence Interval, Stochastic method, Synthetic series, Monte Carlo method.

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