



Assessing the effectiveness of several depth-duration-frequency relationships at regional scale

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Several hydrological analyses need to be based on an accurate estimate of the design storm, that is the expected rainfall depth corresponding, in the considered location, to a given storm duration and a given return period (or frequency of occurrence). The design storm is generally estimated by using parametric depth-duration-frequency (DDF) equations. In particular, this study considers the common case when one needs to estimate the design storm for very short durations and observed rainfall extremes for calibrating the DDF parameters are only available for longer durations. In this case, the DDF curves are generally extrapolated below the range of durations that were used for estimating their parameters. It is well known that this procedure induces estimation errors that depend on the type of DDF equation that is used. The aim of this analysis is to test the capability of 9 different DDF curves to provide an estimate of the design rainfall for storm durations shorter than 1 hour, when their parameterization is carried out by using data referred to longer storms. The study is performed by using annual series of precipitation maxima, for storm durations ranging from 15 minutes to 24 hours, obtained for a dense network of raingages sited in Northern-Central Italy.