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Reducing the uncertainty in indirect estimates of extreme flash flood discharges

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Abstract:	Direct current meter measurements are rarely available for extreme flash floods. Corresponding discharges are generally estimated using so-called " indirect" techniques such as the slope – area method. These methods are based on empirical hydraulic formulae that typically use Manning′ s equation, and have been calibrated and also widely tested for flow conditions that differ significantly from those encountered during flash floods. Recent work conducted in Europe, as part of the HYDRATE research project and other studies, has shown that the use of these formulae and their associated tabulated roughness values available in current guidance documents, without further verification, can lead to over-estimates of peak discharges in the case of flash floods. After having discussed the limitations of indirect methods based on Manning′ s formula, the paper illustrates how the uncertainty in indirect discharge estimates can be reduced through the analysis of various types of data that can be collected during post-event surveys and through consistency checks. Based on a review of current literature and on recent flash flood studies, this paper proposes simple guidelines to assist practitioners in estimating extreme discharges during post-event surveys.

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