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Post-extraction of flood hydrographs under limited and heterogeneous information: Case study of Western Attica event, November 2017

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In November 2017, a storm event of substantial but unknown local intensity caused a flash flood in Western Attica, Greece, which was responsible for 24 human fatalities and large-scale economical losses. Our focus is to the neighbouring catchment of Sarantapotamos, which has been equipped with an automatic stage recorder that was destroyed during the rising of the flood. Our overall objective is the estimation of the rainfall over the broader area of interest, through a reverse rainfall-runoff modelling approach at this specific catchment. Several sources of information are accounted for in order to reproduce the “observed” flood hydrograph, including photos and videos. We then employ Monte Carlo simulations to evaluate the uncertainty induced from limited and even missing data. Utilising the outcome of these analyses, we provide probabilistic estimations of the modelled rainfall, as well as risk evaluations, by estimating the maximum intensities and associated return periods of the storm event across multiple time scales.