



## **Multivariate Analysis of Flood Events**

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Initial attention has been devoted to the design of flood scenarios, or ensembles of them, and to the evaluation of their frequency of occurrence. In fact, the plain application of hydrologic and hydraulic models for the identification of flood prone areas, and their characterization in terms of return period, is not appropriate for risk analysis in case of non-single elements' exposition. The identification of a statistical model able to describe the multivariate joint distribution of flood events in multiple sections is therefore fundamental. For the selection of the appropriate model it is important to highlight that marginal distributions of the typical processes of interest for extreme events analysis (e.g., annual maxima) are asymmetric with heavy tails. The multivariate skew-t distribution, because of its characteristics, seems to be a good candidate for this analysis. An application of this new method to the Tanaro Basin (NW Italy) is here proposed. Very encouraging results suggest the use of this distribution for flood scenario analysis.