

# Study of suspended sediment transport events using copulas

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An exhaustive approach to estimate sediment transport in a watershed is needed to develop better measures for monitoring and extenuating sediment disasters namely the influence on water quality, the availability of aquatic habitat and the alteration of channel morphology. In the present study, we are interested in quantifying and help to understanding what control suspended sediment transport in a watercourse following rainfall events. In other words, we seek to model the characteristics of the sedimentation phenomenon based on multivariate statistical tools, mainly copula. These allow connecting and studying both rainfall characteristics (intensity, duration,) and the variables associated with sedimentation (peak, duration, load ...). The main goal is to identify the rainfall events that cause extreme loads (highest and lowest) of suspended sedimentation. For this end, historical hydrological and suspended sediment concentration (SSC) data from Wilmot River near Wilmot valley, Prince Edward Island, Canada were considered. To ensure a good quality of the bivariate quantile estimation of the considered joint event, different type of copulas belonging to different families were considered and tested. Results show the ability of copula to model the dependence between variables, providing a better quality of bivariate quantile estimation.

*This is joint work with A. St.-Hilaire.*

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