



Analysing event water discharge and sediment load magnitudes against frequency in a small Mediterranean basin (Vallcebre, Eastern Pyrenees).

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Ca l'Isard is a sub-basin of Vallcebre basins, located in the headwaters of the Llobregat River, between 1,100 and 1,500 m a.s.l. in the Eastern Pyrenees. The bedrock consists mainly of red clayey mudstones with some gypsum and sandstone layers. Annual precipitation is about 890 mm and mean annual temperature is about 9°C. Ca l'Isard is characterized because 4.5% of its surface is heavily eroded (badlands).

During ten water years (1995-2004), precipitation, discharge and suspended sediment concentrations were continuously measured. Daily precipitation record is 22 years long. With these variables, the magnitude-frequency relationships of the events recorded were investigated.

When all the events recorded (420) were analysed, the diverse variables considered (precipitation depth, peak discharge, runoff depth, and sediment load) showed significant Spearman rank correlation coefficients among them. Nevertheless, when the major events, corresponding to the upper 10%, were selected, several of these variables were poorly correlated, and the Spearman coefficients strongly depended on the variable used for selecting the events.

For the values over percentile 90 and according to log-normal distributions of the partial-duration series, the maximum daily precipitation recorded (119 mm) would had a recurrence of 20 years and the peak discharge ($2,900 \text{ l s}^{-1}$) would had a recurrence of 7 years. Nevertheless, the adjustment of the partial-duration series of runoff and sediment load series to log-normal distributions showed very poor fits to the higher events that clearly overestimated their respective recurrence periods (90 and

115 years). Alternatively, a bi-modal log-normal distribution was fitted with a much better adjustment, resulting in a recurrence period of only 8 years for the maximum sediment load event, but the magnitude of the events extremely increased with the recurrence periods.

The results confirm the complexity of the sediment processes in these catchments, and demonstrate that the ranking of events according to precipitation characteristics may be adequate for sediment transport purposes only for the main events.