

Precipitation thresholds for triggering floods in Corgo hydrographic basin (Northern Portugal)

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The precipitation is a major cause of natural hazards and is therefore related to the flood events (Borga et al., 2011; Gaál et al., 2014; Wilhelmi & Morss, 2013). The severity of a precipitation event and their potential damage is dependent on the total amount of rain but also on the intensity and duration event (Gaál et al., 2014). In this work, it was established thresholds based on critical combinations: amount / duration of flood events with daily rainfall data for Corgo hydrographic basin, in northern Portugal. In Corgo basin are recorded 31 floods events between 1865 and 2011 (Santos et al., 2015; Zêzere et al., 2014). We determined the minimum, maximum and pre-warning thresholds that define the boundaries so that an event may occur. Additionally, we applied these thresholds to different flood events occurred in the past in the study basin.

The results show that the ratio between the flood events and precipitation events that occur above the minimum threshold has relatively low probability of a flood happen. These results may be related to the reduced number of floods events (only those that caused damage reported by the media and produced some type of damage). The maximum threshold is not useful for floods forecasting, since the majority of true positives are below this limit. The retrospective analysis of the thresholds defined suggests that the minimum and pre warning thresholds are well adjusted. The application of rainfall thresholds contribute to minimize possible situations of pre-crisis or immediate crisis, reducing the consequences and the resources involved in emergency response of flood events.

References

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