



A centennial catalogue of hydro-geomorphological compound events and corresponding atmospheric forcing

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In Portugal floods and landslides represent two of the most frequent and hazardous natural disasters. Information on past floods and landslides that caused significant human consequences in Portugal from 1865 onwards is gathered in the DISASTER database (Zêzere et al., 2014). This database was built under the assumption that socio-economic consequences of floods and landslides are relevant enough to be reported by regional and national newspapers, which were the data source and can be replicate elsewhere. The DISASTER database contains detailed information on the spatial location and human impacts (fatalities, injuries, missing people, evacuated and homeless people) of many hydro-geomorphologic cases (flood and landslide cases).

These hydro-geomorphologic disaster cases are grouped in a restrict number of DISASTER events that were selected according to the following criteria: a set of at least 3 DISASTER cases sharing the same trigger in time (with no more than 3 days without cases) which have a widespread spatial extension related to the triggering mechanism and a certain magnitude. At total, 130 hydro-geomorphological events (HGE) were identified in Portugal mainland (938 fatalities and ~41000 homeless people). Each HGE was characterized with the following attributes: HGE type (e.g. landslides, floods, flash floods, urban floods); date of occurrence (year, month and days); duration in days; georeferenced spatial location; number of fatalities, injured, evacuated and homeless people (Pereira et al., 2018).

Flood and landslide recorded in HGE database show that single damaging landslide events are very rare. The most common HGE is the occurrence of landslides and floods together since they often require long rainy periods and a higher soil water content. HGE compound events with both floods and landslides represent the highest percentage of events (~20% of events), while floods present the second highest percentage (~13%). Therefore, from the HGE database, a sub-set of HEG compound events was selected in order to provide a detailed analysis of each one of these events, including their human impacts, pre-conditioning precipitation analyses and the underlying atmospheric circulation that could have amplify the impact of the events.

References:

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