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Soil erosion concentration review at different time scales in Mediterranean landscapes

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Soil erosion in Mediterranean conditions is a time concentrated processes produced by extreme pluvial events. We have reviewed the scientific literature and we conclude that, yearly, $^1/_2$ of annual erosion is produced by only three events. Furthermore, these pluvial events some time are not absolute maximum rainfall events.

Such concentration of soil erosion in time seems to be observed, too, at long interval. The coincidence of results from different environments, plot (size, length), and pluvial conditions, let us to suggest that Mediterranean areas are under extreme concentrated soil erosion. By this reason, soil erosion rates should be cautiously used.

In other temporal scale, geomorphological evolution in these areas seems to be controlled by the effects of concentrated processes in time. Such processes have been detected in morphosedimentaries Holocene records from NE inland of Spain, and they have been related too with the occurrence of extreme events, as at present. These processes some times seem to be magnified by human interference.

The main expression of such geomorphological activity during the Upper Holocene it is observed in slope evolution, alluvial fans and low terraces of small rivers. Aggradations and degradations stages have been generated by extreme geomorphological processes as a consequence of high intensity climatic events. Sedimentary records let us to reconstruct the environmental conditions under which such evolution occurred. Dating of these sediments show a generalized trend to increase frequency of extreme events until present. We show a simplified model of such evolution for NE inland of Spain.

We discuss the interaction of magnitude-frequency analysis and their links with climatic variability and climatic change.