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Hydrogeomorphological mapping and comparison with the spatial extent of exceptional floods in the Mediterranean area: Flash flood in Aude (1999), Gard (2002) and Var (2010) Department (France)

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On November 12th and 13th, 1999, September 8th and 9th , 2002 and June 15th , 2010, three uncommon rainfall events occurred in the Mediterranean part of France (400 mm and more in 24 hours). These generated extensive damage (2 billions euros) and loss of human lives (65 dead). These events offered a rare opportunity for comparing the observed flood areas with the boundaries of the floodplain. The Hydrogeomorphological approach is rising up in the engineering field relative to the natural hazards forecast.
If we superimpose the boundaries, we can measure an excess length and a non-excess length. We can also proceed to a research on the origins and the process that originate an excess. Thanks to graphical and numerical processing, the results obtained widely show the floods' extent within the floodplain of the twenty-seven rivers studied. Besides, there were no incoherent situations thanks to the principles of the Hydrogeomorphological mapping. The contradictions with hydrogeomorphological mapping principles remain very limited (about 10%) and clearly delimited. So, this study demonstrates the efficiency and the importance of using this field approach.