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Probabilistic flood forecasting tool for Andalusia (Spain). Application to September 2012 disaster event in Vera Playa.

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Torrential and heavy rains are frequent in Andalusia (Southern Spain) due to the characteristic Mediterranean climate (semi-arid areas). This, in combination with a massive occupation of floodable (river sides) and coastal areas, produces severe problems of management and damage to the population and social and economical activities when extreme events occur.

Some of the most important problems are being produced during last years in Almería (Southeastern Andalusia). Between 27 and 28 September 2012 rainstorms characterized by 240mm in 24h (exceeding precipitation for a return period of 500 years) occurred. Antas River and Játicо creek, that are normally dry, became raging torrents. The massive flooding of occupied areas resulted in eleven deaths and two missing in Andalucía, with a total estimated cost of all claims for compensation on the order of 197 million euros.

This study presents a probabilistic flood forecasting tool including the effect of river and marine forcings. It is based on a distributed, physically-based hydrological model (WiMMed). For Almería the model has been calibrated with the largest event recorded in Cantoria gauging station (data since 1965) on 19 October 1973. It was then validated with the second strongest event (26 October 1977). Among the different results of the model, it can provide probability floods scenarios in Andalusia with up 10 days weather forecasts.

The tool has been applied to Vera, a 15.000 inhabitants town located in the east of Almería along the Antas River at an altitude of 95 meters. Its main economic resource is the “beach and sun” based-tourism, which has experienced an enormous growth during last decades. Its coastal stretch has been completely built in these years, occupying floodable areas and constricting the channel and rivers mouths. Simulations of the model in this area for the 1973 event and published in March 2011 on the internet event already announced that the floods of September 2012 may occur.