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Hydro-Meteocean Nature of some Extreme Flood Events and Some Consequences

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The Santa Irene flood event, at the end of October 1982, is one of the most dramatically widely reported flood events in Spain. Its renown is mainly due to the collapse of the Tous dam, but its main message is to be the paradigm of the incidence of the maritime/littoral weather and its temporal sea level rise on the coastal plains inland floods. Looking at damages the paper analyzes the adapted measures from the point of view of the aims of the FP7 SMARTeST Project related to the Flood Resilience improvement in urban areas through looking for Technologies, Systems and Tools an appropriate "road to de market". The event, as frequently, was due to a meteorological phenomenon known as "gota fría" (cold drop), a relatively frequent and intense rainy phenomenon on the Iberian Peninsula, particularly on the Spanish east to southeast inlands and coasts. There are some circumstances that can easily come together to unleash the cold drop there: cold and dry polar air masses coming onto the whole Iberian Peninsula and the north of Africa, high sea water temperatures, and low atmospheric pressure (cyclone) areas in the western Mediterranean basin; these circumstances are quite common during the autumn season there, and, as it happens, in other places around the world (East/Southeast Africa). Their occurrence, however shows a great space-temporal variability (in a similar way to hurricanes, on Caribbean and western North-Atlantic areas, or to typhoons do). As a matter of fact, all of these equivalent though different phenomena may have different magnitude each time.
This paper describes the results of a detailed analysis and reflection about this cold drop phenomenon as a whole, on the generation of its rains and on the different natures and consequences of its flood. This paper explains also the ways in which the maritime weather in front of the basin and the consequent sea level govern floods on the lowest zone of any hydrographical basin, showing that event as a real paradigm to explain that climatic conditions in the adjacent marine basin influence on coastal and even inland flooding phenomena. It then briefly analyzes also other apparently different kind of flood events on further upper inlands and compares the respective maritime processes and inland floods to show the relevance of the former in the right description of the latter.

ADDITIONAL INDEX WORDS: cold drop; Santa Irene flood; coastal flood; marine flood; dam collapse; maritime weather; storm surge; set-up; cyclones; sea level. Hurricanes.