



How to solve the relationship between precipitation, floods and flood damages in Mediterranean Regions?

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Since the first session on cost of natural hazards included in the programme of the Natural Hazards IWG held in the EGS General Assembly, more than 15 years ago, with the scepticism of some people, this subject has been revealed as a major challenge nowadays. However it is not a problem that can be solved in the same way in all the countries. While in the center of Europe this question can be addressed by detailed information on the damages provided by the reinsurance companies, they have little information on the events that occur in the Mediterranean countries. In these, it is only possible to have, at most, the amount of insured damages provided by companies such as the Insurance Compensation Consortium in the Spanish case. Only in exceptional cases is possible to recover more detailed information, because the systematic post-event surveys campaigns or the “retour of experience” reports are not supported by the administration in the major part of the Mediterranean countries. Besides these limitations, the problem is complicated if we consider that the greatest part of the floods in the Mediterranean region are produced by heavy rainfalls that give place to flash-floods, in-situ floods or urban floods consequence of the saturation of the drainage system. Then, no discharge data is available and flood damage data is essentially descriptive.

Here we analyse this challenge in the framework of the IAHS Panta Rhei initiative “Flood risk change”. The HYMEX project has provided information for Italy, France, Greece and Spain, for the period 1981-2015. The Eastern part of Spain has been taken as case of study, where information from the Insurance Compensation Consortium has been provided for each flood event identified and characterized in the HOPE project for the period 1996-2015. A state of the art of the damage functions has been updated and applied to some cases for which the water level is available. However, as damage data are aggregated by postal code and in the major part of the cases hydrological measurements are not available, the only possibility to have a systematic analysis is working with the precipitation. The relationship between precipitation and insurance data has been assessed using logistic regression models for the probability of large monetary damages, conditioned to heavy precipitation events. Results show that our model is able to simulate the probability of a damaging event as a function of precipitation. The relationship between precipitation and damage provides insights into flood risk in the Mediterranean and is also promising for supporting flood management strategies.

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