

# Hydrology and Historical Data in Flood Risk Analysis

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## Perspective

Floods are the foremost common natural disaster within the world and are getting a more and more important problem with large economic losses and social disruption. Technical measures for mitigating flood impacts are included within three basic categories: predictive, preventive and corrective measures. Prevention techniques are broadly employed by most of the world's flood agencies using both probabilistic and deterministic methods. In both cases, the estimation of rare, large magnitude floods is problematic thanks to the short gauging station records and their limited spatial distribution. Hydrologists and engineers have developed different techniques to deal with the shortage of flood data by using precipitation data, regional flood information and by calculating the so called "probable maximum flood". New developing methods on discharge estimation of past floods using geomorphological indicators (palaeofloods) and documentary evidence allows the lengthening of instrumental records by hundreds to thousands of years.

The scientific and applied interest of those studies is evident since the estimation of return periods used for design purposes and risk planning are often supported by actual data, instead of reliance on statistical extrapolation of instrumental flood series that always record only relatively modest events. The multidisciplinary nature of those sorts of studies (geologists, geographers, historians, climatologists, engineers, hydrologists, meteorologists, mathematicians, and end users with different backgrounds) makes it difficult to

seek out a standard forum for discussion in established scientific societies. The guest editors of this special issue have participated in the EC funded SPHERE project. That successful experience promoted the organisation of the Workshop on "Palaeofloods, historical data & climate variability: Applications in flood risk assessment" held in Barcelona, Spain, 16–19 October, 2002. The workshop was attended by 140 researchers and professionals, representing some 20 countries. This workshop provided a critical forum for the dissemination of state-of-the-art methodologies to assist flooding risk assessment, and to instigate the incorporation of palaeoflood and historical flood evidence within flood legislation at the European level.

The essential aims of this workshop were: (a) to demonstrate the prevailing techniques for the reconstruction of past flood discharges, (b) to discuss the standardisation of this system, (c) to comprehensively disseminate such methodologies for technical personnel within the administration and therefore the private sector, (d) to demonstrate the effective ready to use tools (such as software, GIS applications, etc.) developed in past and on-going projects and (e) to provide guidelines for data collection and their correct statistical use. Additionally to those sessions, two field excursions, to Girona and Monistrol de Montserrat, were organised so as for instance the methodology developed during the EU SPHERE project for obtaining palaeo and historical flood data, estimating past discharges and applying this data in risk analysis. As a result of the presented contributions and further discussions, a reduced number of papers from each session were selected to contribute to this special issue.

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