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1 Comparative Study of Various Techniques for the Estimation of Flood Risk Extent

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There are two major problems when estimating the flood extent for an area. Firstly, the complexity of the wide variety of spatially relevant flood-related data and the amount of information contained within these data can be overwhelming and not easily interpreted without often costly and time-consuming hydrologic expertise, especially in light of ongoing updates and continued improvement of the pertinent data. Thus it would be highly desirable to automate the process of estimating the flood extent. Secondly, due to the wide variety of criteria usually considered in flood risk analysis, there is also a broad spectrum of different units involved. This predicament can only be overcome when all data are put into a common unit. In an attempt to solve these predicaments, three roughly "automated" techniques (Mahalanobis distance, equally likely decision and maximin techniques) were compared to a methodology based on hydrologic expertise that can be considered up-to-date with current flood risk zone delineation knowledge. An in-depth comparison of the resulting flood risk maps was undertaken, using a study area in northern Apulia (Italia) that is known to suffer from periodic flood events. The comparative analysis has revealed that of the three alternative methods only the Mahalanobis distance technique gave moderately comparable results to the methodology based on hydrologic expert knowledge. The results suggest that hydrologic expertise cannot be bypassed in flood risk extent analysis.