



Can the basin morphology alone provide an insight on floodplain delineation?

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The availability of new technologies for the measurement of surface elevation (e.g., GPS, SAR interferometry, radar and laser altimetry) allowed to address the chronic lack of high resolution elevation data, making more attracting the use of DEM-based models. As a result, there is an increasing number of scientists that are focusing on DEM-based automated procedure aimed to delineate the floodplains.

The objective of the present research was to evaluate the exposure of the Italian territory to flooding exploiting the potential of morphological indices (drainage area, local slope, curvature, etc.). In particular, it was found that the flooding areas can be delineated fairly well through a modified topographic index $W_m = \ln(a^n / \tan(\beta))$, where a is the drainage area per unit contour length, $\tan(\beta)$ is the local slope in the steepest descent direction and n is an exponent that was found to be close to 0.15-0.20. The procedure proposed was tested over a number of Italian basins using, for calibration and validation, the existing cartographic and technical documentation on flood exposure and risk produced by the local Agencies recently instituted according to actual legislation on soil defence. The analyses have been carried out using a digital model at 90m of resolution produced by the NASA in February 2000