Floodplain delineation using cluster analysis of geomorphometric variables and class spectral statistics

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Floodplain delineation it is very important in geomorphology and hydrology. Floodplains are defined by applying morphologic and hydrologic criteria.

Nowadays DEMs are the most used representations of terrain and landforms. We present a method of morphological floodplain delineation from DEMs based on cluster analysis of geomorphometric variables and class spectral statistics. The spectral distance between class centroids is smaller for the classes that overlay with the floodplain.

The method is easy to be implemented in most GIS packages and perform well on different scales and DEM sources.

Compared with other methods for floodplain delineation, our method is robust, and depending the geomorphometric variables included in the cluster analysis, both the morphology and hydrology criteria can be used.

The precision of the delineation depends on the DEM resolution, and on the quality of the DEM, on representing the floodplain.