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Structural properties of floodplain width in the Rhone catchment: methodology and results

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The increasing availability of medium to high resolution DTMs offer opportunities to explore geomorphologic properties in a continuous way over large areas, but new methodological approaches may be required to handle such datasets. These advances may result in new insights in different aspects of fluvial geomorphology. In this study we focus on floodplain width properties in the French Rhone catchment (ca. 45000 km of river length). Floodplains are determined from a DTM with a 50 m resolution provided by the Institut Géographique National (IGN). From this, the floodplain axis was calculated as vectors with 100 m length, for which attributes like floodplain width are assigned. A statistical segmentation test was used to identify breaks in the floodplain width series along the river continuum and as such group the vectors into segments. These segments represent geomorphologic homogenous units for the studied attribute (average floodplain width). In a next step the spatial distribution of floodplain segment breaks, lengths and widths is studied within the entire Rhone catchment in function of structural properties, like topography, geology and glacial history. Preliminary results indicate a spatial variation and scale dependency of the influencing properties. Lithology and position of faults have a determining influence on the position of breaks in floodplain width on a local scale in many (sub)alpine catchments. On a larger scale structural geological patterns like orogeny and general nature of the sediments have a mayor influence. The quaternary geomorphologic history, and in particular the glaciations history, is superimposed on this, mainly influencing the larger floodplains. The applied methodology suffers from computational problems and the unavailability of digital datasets with a comparable scale – like detailed geological data – for such an extended area.