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GIS-based analysis of channel and overbank deposition areas formed by flash floods: a case study from the Jagniecy Potok (Sudetes, SW Poland)

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The study aims to detect spatial patterns of channel and overbank deposition areas. Considerable sedimentation is usually associated with extreme hydrological events. In particular, flash floods affecting upper reaches of mountainous rivers are typically caused by heavy summer rainfall and an increase in stream power. GIS techniques allow one to detect the areas meeting fixed environmental conditions. In particular, these procedures can be used for spatial modelling erosion and accumulation zones.

We focus on the case study from the Jagniecy Potok stream, a left tributary of the Izera river, which drains the Izerskie Mts. (SW Poland/N Czech Republic). The river crosses a summit planation surface covered by a peatbog. Gentle slopes imply the considerable sinuosity of the stream.

The GIS analysis is based upon the Digital Elevation Model (DEM) generated from topographic maps 1:10 000 in quasi-stereographic projection. Several conditions concerning catchment topography, general rules governing spatial distribution of deposition zones as well as channel geometry are superimposed. This allows one to estimate the probable patterns of sedimentation within the valley bottom. The results obtained from GIS analysis are compared with the high-resolution orthophotomap of the considered catchment.