



Sediment disconnectivity in lowland North-Eastern Romania induced by landforms, climate and humans

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Sediment connectivity is a measure of sediment fluxes along the fluvial system continuum, from the sources, to the outlet. While the deposition is a reality in any fluvial system, connectivity refers to the existence of fluvial morphology that will allow the continuous erosion-transport-deposition triad to develop. Since the fluvial morphology is easy to be depicted on high resolution DEMs, the development of specific geomorphometric indices is a good way to estimate the connectivity on wide areas. In lowlands, where different factors induced a specific morphology, characterized by wide and flat floodplains incised by the channel network, there are wide areas which do not present obvious surface drainage and channel continuity. We present the case of North-Eastern Romania lowland, a region where the arid climate and the human interventions during the last 500 years generated a plethora of sediment discontinuity situations. First of all, the quaternary geomorphological evolution of the study area in the context of a monoclinic geological structure generated the development of elongated catchments and valleys, with narrow hills, wide floodplains, and underfit streams. The inability of the underfit streams to evacuate the sediments produced on hillslopes by soil, gully and landslide erosion, during the Holocene generated an increase of sediment stored on hillslopes and at their bases. These deposits also favored the infiltration of the flowing water and a lack of channel morphology. The dryness of the climate made the local populations, in the last 500 year to construct numerous anthropic lakes in order to be able to harvest the water in the summer periods. These anthropic interventions increased the sediment disconnectivity and generated the aggradation of the floodplains. In order to precisely quantify this disconnectivity, we have mapped on high resolution DEMs and historical sources, the fluvial morphology of several right side tributaries of Bahlui River and estimated the sediment storage. Different sediment connectivity indices were tested and we proposed certain improvements of the methodology in order to better assess the situation of the study area.