



## **Connecting high-erodible hillslopes with sediment export in a meso-scale river basin: the role of in-channel sediment storage (Isabena River, NE Spain)**

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The study investigates the temporary storage and transfer of sediment in the riverbed in a meso-scale dryland catchment (Isabena River, Pre-Pyrenees, NE Spain) that experiences intensive erosion from upland badland hillslopes causing severe sedimentation of a large reservoir located at the downstream end of the basin. A field campaign was carried out along a 33 km long river stretch at 80 cross-sections to estimate the spatial patterns and degree of coverage of in-channel sediment storage. The high spatial resolution data on sediment storage were related to estimates of riverbed slope, geology and cross-sectional characteristics to study geospatial units and pattern formation of the river system and to determine the role and the order of magnitude of in-channel storage in the annual sediment budget of the catchment as well as the residence time of fine sediments in the river channel. The sediment storage capacity of the river channel was then related to measured time series of sediment fluxes eroded from representative badland hillslopes and to time series of suspended sediment transport measured at the catchment outlet. The analysis showed that the sediment storage in the riverbed is the key factor in explaining the temporal pattern of connectivity of sediment export by linking the source area of sediments and the sedimentation observed in the reservoir. The study thus attempts to contribute to the currently limited knowledge on the role of the transport pathway of the river system as intervening sediment storage in watersheds that experience extreme soil-erosion stress.