



River captures along the water-divide between the Ebro and Duero drainage basins (N of Spain): Future predictions from numerical modelling.

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The Ebro and Duero rivers flow along the two largest Tertiary sedimentary basins in the N of Spain. These two basins are only connected along a relatively narrow area in which relatively weak Tertiary strata outcrop. The topography in both sides of the water-divide in this connecting zone is different: low and rough in the Ebro basin and high and smooth in the Duero basin. These differences show the evolution of the paleowater-divide through several episodes of river capture of the Duero system by the Ebro streams. These ancient captures are recorded by a set of well-exposed paleoriver gorges that are dry and hanging in the Ebro side and by documented river captures. In this context of strongly aggressive stream piracy we performed a set of numerical models to predict the future interactions of these two rivers along the water-divide of the connecting zone. These models, made of 4 different morphotectonic units to account for the geological complexity of the region, show the potential evolution of erosion and migration of the water-divide through time. The models integrate potential future climatic scenarios that might increase the erodability of exposed rocks. The results of modelling are constrained by geological data from the study region as well as by previous results of a larger-scale forward numerical model of the entire Ebro river basin. One of these results is that the erosion evolution seems to be very sensitive to the rheology of the lithosphere.