



Sediment budget of a tectonically active palaeo-sediment routing system (Eocene, southern Pyrenees)

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Sediment routing systems convey sediment from source to sink and are potentially amenable to a mass or volumetric budget. The supply of sediment and its characteristic grain-size mix are key controls on depositional facies and stratigraphic architectures in sedimentary basins. Consequently, constraints on sediment caliber, budgets and fluxes are a prerequisite for effective stratigraphic prediction. Here, we investigate a mid-late Eocene (41.6-33.9 Ma) sediment routing system in the Spanish Pyrenees to derive a full volumetric sediment budget, weighted for grain size fractions, partitioned between terrestrial and marine depositional sectors, and with sediment fluxes between major depocenters quantified. The sediment routing system was controlled by syn-depositional thrust tectonics, and consisted of two major feeder systems eroding the high Pyrenees that supplied a river system draining parallel to the regional tectonic strike and that ultimately exported sediment to coastal, shallow marine and deep marine depocenters. We show significant changes in both the volume and grain-size distribution of sediment eroded from the Pyrenean mountain belt between three time intervals in the mid-late Eocene, which controlled the magnitude, locus and characteristics of the preserved stratigraphy. The ratio of sediment supply to accommodation generation has a major role in determining sediment dispersal patterns in wedge-top tectonic settings.