



Spatial and temporal changes in apportionments by using sediment fingerprinting in a Spanish Pyrenean river catchment.

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The Barasona reservoir has suffered from siltation since its construction, with the loss of over one third of its storage volume in around 30 years (period 1972-1996). Information on sediment contribution and transport dynamics from the contributing catchment to the reservoir is needed to develop management plans for maintaining reservoir sustainability. Large variability in sediment delivery was found in previous studies in the Barasona catchment (1509 km², Central Spanish Pyrenees) and the major sediment sources identified included badlands developed in the middle part of the catchment and the agricultural fields in its lower part. In this study the < 63 μm sediment fraction from the channel bed sediment samples from the main rivers (Ésera and Isábena), their tributaries and surface reservoir sediments, the latter spanning two decades, are investigated following the fingerprinting procedure to assess how the land use sediment contributions change along the streams and on time to the reservoir. Subsoil source (badlands included) contributions to channel bed sediments of the main rivers are limited in the catchment headwater which turn to be greater than 70 % for river reaches closer to the reservoir. In the same way, the presence of the badlands and the greater percentage of bare soils in the southern part of the catchment are main source of sediments (> 50%) for the southern tributaries. Differences in source apportionments between the two time-spanning reservoir samples reveal that agricultural fields contributed more in the 90s. Study fine sediment characteristics and their contributions in river catchments provide unique and diverse information to address catchment management problems, improving the spatial and temporal knowledge of land use sediment source contributions along the catchment to the reservoir infill.