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The Sarrón catchment: Two Unmixing model comparison

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Fine-grained sediment is an important pollutant and determining its provenance is an important issue for reservoir management and river quality. Sediments accumulated in reservoirs have greatly decreased water storage capacities and are a major threat to the sustainability of water resources around the world. Using fingerprinting procedures is now a widely used approach in catchment management to assess the source of sediments. However, the outcome of these studies often depends on the type of model used to determine the relative contribution from different sources.
The aim of this study is to compare the sediment contributions from two different unmixsing models, MixSIAR (Bayesian model) and FingerPro (Determinist model). Both models are tested in the Sarrón catchment (116 km2) that flows into the Barasona reservoir from the south-eastern part. The study area was selected because of its independent behavior of the rest of the river catchment that flow into the reservoir and also because of its lithological homogeneity composed by sandstones, claystones and conglomerates of the Graus Formation to better identify the factors of variation involved.
The two models comparing the radionuclides and stable elements contents in sediments with their possible sources from samples collected across the catchment assessed the relative sediment contribution from the different land uses. After running the models, the applications and results obtained allowed to identify the differences and similarities from both mixing models when they are applied to the same dataset.