



Tracing discharge in the Southern Pyrenees

Jakob Heinzle (1), Matthias Konzett (2), Christian Siebert (3), and Sabine Kraushaar (4)

(1) Department of Geography and Regional Research, University of Vienna, Vienna, Austria (jakob.heinzle@gmx.at), (2) Department of Geography and Regional Research, University of Vienna, Vienna, Austria (m.e.konzett@gmail.com), (3) Helmholtz Centre of Environmental Research – UFZ, Halle, Germany (christian.siebert@ufz.de), (4) Department of Geography and Regional Research, University of Vienna, Vienna, Austria (sabine.kraushaar@univie.ac.at)

The Isábena catchment in the Southern Pyrenees (445km²) suffers from increased soil erosion, which leads to an ongoing siltation in the Barasona reservoir at the river catchment outlet. The area is characterized by limestone in the northern higher altitudes, marl and conglomerates in the foothills and sandstone in the agricultural used southern plains. Several sediment-fingerprint and erosion studies from that area showed, that the vast majority of sediment input results from marly badlands occupying less than one percent of the area.

To further deepen the understanding of the sediment export from the catchments we conducted a hydrological fingerprint to analyse the relative discharge contribution from the different geological units to the main Isábena river. Therefore, 35 water samples from springs, all major tributaries and the Isábena river were taken throughout the catchment and afterwards analysed for their major ions and trace elements, as well as their stable isotope signatures $\delta^{18}\text{O}$ and $\delta^2\text{H}$. At all sample locations discharge measurements were conducted.

The study qualitatively evaluates the element concentrations of the waters and addresses suitable elements to characterize the discharge from the different lithological units. In a further step the relative contribution of the waters to the main Isábena river is calculated and conclusions drawn in reference to the connectivity of the tributaries.