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Reconstructing changing sediment sources in a Mediterranean mountain river catchment using composite sediment fingerprinting

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The 264 km^2 Büğdüz catchment in the western part of the territory of Sagalassos, Taurus Mountain range, 100 km north of Antalya, is being investigated for the impact of climate change and human activity on sediment sources in a Mediterranean setting. Ninety-four cores were taken within the alluvial plain, and numerous topsoil samples were taken over the entire catchment.

For reconstructing the changing sediment sources over time, several fingerprinting methods are applied. Lithologies present in the gravel fraction > 2 mm and mineral content of the sand fraction, 2mm<x<63μm serve as qualitative tracers. In contrast, the silt/clay fraction < 63μm is geochemically analyzed, and the measured elements serve as quantitative tracers.

The Büğdüz catchment was divided in four subareas based on sedimentological and geomorphological factors, and the mineralogical composition of the sediment differs considerably between the various subareas, at least for the most recent sedimentation phase. Moreover, the carbonate content of the alluvial sediments increases significantly in downstream direction, suggesting the importance of local sediment sources. In addition, a temporal variability of the sediment sources is present at least for the most upstream area of Beşkavak, with obvious shifts in mineral composition and carbonate content.

While the ungoing analyses will yield a deeper insight of the spatial and temporal variability of sediment sources within the Büğdüz catchment, the impact of climate change and human activity in the area is already clearly evidenced by the results up to date.