



## **Provenance and sediment dynamics within river basins in Western Peru through detrital zircons U-Pb ages**

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U–Pb dating of detrital zircons from clastic sediments by LA-ICPMS has become a popular method in sedimentary correlation and provenance studies. Because of remarkable durability, detrital zircons may be reworked through multiple sedimentary cycles and provide an ideal material to study the sedimentary provenance in rivers and the erosional characteristics. The Western side of the Peruvian Andes has experienced multiple pluvial periods induced phases of erosion and the formation of subsequent cut-and-fill terrace sequences since the Pleistocene. The aim of the study is to estimate the source areas of the terrace and modern deposits to infer changes in sediment dynamics through time and correlate them with the climatic change and especially precipitation patterns. To this extent, we determined the provenance of 4 dated terrace deposits along with modern sediments from the same streams by matching detrital-zircon ages with crystallization ages of source rocks. Age populations of detrital zircons are derived using U-Pb LA-ICP-MS analysis of about 50 zircons. Results show changes in the sediment provenance through time. Nowadays, sediment source areas are mainly located on the uppermost reach of the rivers whereas during the Pleistocene, sediment source areas were both located in the headwaters and along the middle reach of the rivers. These differences in terms of provenance could correlate with a change in precipitation locations and rates. Indeed a scenario where the locus of precipitation occurrence shifted from the middle reaches including the Altiplano during the past, to the Altiplano only as observed today, along with higher precipitation rates during the periods of terraces formation, offers an explanation to explain the erosional patterns recorded by detrital zircons.