



Fluvial terraces and alluvial fans in southern Peru: Do they record climate change?

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River terraces witness changes in the dynamics of a river system. This is also true for alluvial fans which are amongst others very sensitive to changes in baselevel and especially climate. Several river systems exist in the arid climate of southern Peru with absolutely spectacular fluvial terraces and alluvial fans. Two valleys were chosen for a detailed study, aiming to characterize the nature of the formation of these geomorphologic features, with special attention to the sediment source, possible triggers for sediment aggradation and incision and the timing of terrace formation along the valley.

Results from the Pisco valley at 13.5°S show that fluvial terraces and alluvial fans formed in response to a changing climate driven by changes in the easterly wind systems. Sediment was deposited during wet periods: from 55-36 ka (Minchin wet period) and 26-15 ka (Tauca wet period). These two wet periods enclose most of the deposits, although younger deposits (around 11 ka and during the Holocene) also exist. These deposits are smaller in size and do not form individual terrace levels. Sediment aggradation started in the lowermost valley part, and the location of sediment accumulation shifted upstream (backfilling). The start of incision cannot be dated by means of luminescence dating, but we assume that incision started before the end of the wet period due to sediment depletion on the hillslopes. This is supported by decreasing ages of the top deposits of the terrace systems in the upstream direction.

Field work in the Majes valley in the south of the Pisco valley revealed a similar architecture of the fluvial terraces and fans compared to the Pisco valley with multiple terrace levels. One difference is that river terraces in the Majes valley are rarer and

mostly closely linked to alluvial fans. Furthermore, the terraces are constrained to a segment in the middle part of the valley beneath the knickzone. Preliminary dating results from the Majes valley show that aggradation of the terraces and alluvial fans also occurred during the last 100 ka. A detailed chronology will be presented from both valleys.