

Climate-driven variations in sediment flux, Pisco valley, Central Peru.

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The Late Quaternary development of the lower Pisco valley in Central Peru is characterized by two major phases of sediment accumulation and erosion forming cut-and-fill terraces. Each of them comprises well-sorted fluvial conglomerates at the base and poorly sorted debris-flow breccias on the top. Optically Stimulated Luminescence (OSL) dating is applied to establish a chronological framework for the formation of the terraces. Samples were taken from conglomerates and locally sourced alluvial fans.

OSL-ages show that conglomerate deposition occurred during wet periods on the Altiplano (Minchin and Tauca, e.g. Fritz et al., 2004). A similar pattern of sediment deposition and erosion was found on the Altiplano by Farabaugh & Rigsby (2005), although there are no breccias in the sedimentary units.

We therefore conclude that the terrace sequences reflect the response of the landscape to the influence of the Atlantic and Pacific wind systems. An enhanced Atlantic influence brings monsoonal climate and humidity to the Rio Pisco headwaters. Due to enhanced runoff, valley erosion in the higher steep portion increased, and conglomerates were deposited in the lower flat reaches. In addition, the monsoonal climate increased hillslope weathering rates. In contrast, dry periods on the Altiplano are associated by an enhanced Pacific influence with an episodic character of precipitation. This climate promotes debris flows on hillslopes, thereby forming the breccias.

REFERENCES

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