

Geomorphological evolution of the Rimac River's alluvial fan, Lima, Peru

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ABSTRACT: The alluvial fan of Lima is a complex landform, resulting from the sediment contributions of the Rimac River and the coalescence of the alluvial fans of the tributaries of the Rimac River. Depositional zones in the fan and changing main channel and distributary channels are influenced by the palaeo-relief inherited from a semi-arid climate and by the climatic changes. The upper sedimentary sequence of the fan, dominant on the Costa Verde, is of Upper Pleistocene–Holocene age. The sediments forming it are non-cohesive and are highly mobile during floods and earthquakes. The dominant features in this sequence, intertwined channel facies and laminar flows, were influenced by the Pleistocene–Holocene postglacial marine transgressions. A deeper understanding of the evolution of the Lima alluvial fan provides insight in to the fan's future evolution in the framework of active tectonics and climate change. The Lima fan is an area with high human population density and is subjected to floods and debris flows resulting in subsequent loss of human life and properties. Therefore, the improved understanding of the fan's evolution, resulting from this study, will contribute to a better definition of high risk areas of potential human disaster caused by these natural processes. Cyclic-fan-development, presently controlled by glacial sea level lows and palaeo-topography will continue regardless of human intervention in attempts to prevent natural disasters in Lima.

Key words: Holocene, Andean tectonics, marine transgression, climate change, geomorphology

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