



Tributary-junction fans formation in the Atacama Desert due to the March 2015 extraordinary event and its contribution to long term mountain landscape modification in the Andes.

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This work highlights the effects on the alluvial fan surfaces, the variations on channel beds and the formation of depositional lobes after the March 2015 debris flows triggered by a rainfall that affected one of the southernmost valleys of the Atacama Desert (~60mm average rain in 72h). We report the facies assemblages triggered for this event and we propose a sedimentary and geomorphic sequence of landscape modification. Determining the facies associated allows to understand the relative fluidity of the flows and the behaviour of the catchments after one heavy and extraordinary event. Additionally, we assess previous interpretations of the facies assemblages and radiocarbon age datasets defined for these valleys that have been used as a proxy for paleoclimate reconstructions during the Holocene. Finally, we reconstruct the sedimentary behaviour of tributary-junction alluvial fans for an extraordinary event and its contribution on long-term source to sink model of the rivers that drain the arid western slope of the Andes.

Keywords: tributary-junction fans, debris flows, Atacama, extraordinary event