



The El Risco landslide, Gran Canaria: a small-scale analogue for giant lateral collapses of ocean island volcanoes?

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Giant landslides on ocean island volcanoes are catastrophic events that occur relatively frequently on the geological time-scale. Recent studies have focussed on the identification of landslide deposits on the sea floor and their potential source areas on-land. In addition, several workers have investigated the mechanisms that trigger flank failure. However, the collapse structures and collapse dynamics of such events remain poorly constrained, partly due to the sparse clues left behind after landsliding, or to their burial by post-collapse volcanism. On the other hand, smaller-scale slope instabilities are much more frequent and may be completely preserved, thus offering an opportunity for analysis of structures analogous to those of large volcano-flank collapses. Indeed, recent studies of vertical subsidence phenomena have spanned scales ranging from sand-box experiments, to pit crater collapse, hydrocarbon reservoir subsidence, and caldera formation. These studies suggest that the geometric and kinematic aspects of such vertical subsidence events are scale-independent; the same may therefore be true for lateral collapse events.

Northwest Gran Canaria, Canary Islands, is characterised by a concave coastline, which represents the trace of a Miocene giant landslide. Within this collapse scar, several smaller landslides have taken place as a major process of coastal erosion. Our detailed study of one of the incomplete (i.e. ongoing) landslides, the El Risco slide (covering $\sim 40,000 \text{ m}^2$), reveals numerous structural similarities with both analogue modelling experiments and natural examples of giant volcano-flank collapse, such as

the San Andrés giant slump on the island of El Hierro, Canary Islands, and the Hilina slump on Kilauea volcano, Hawaii. Especially for the initial stages of collapse, these similarities may help to provide new insights into the way giant landslides behave, evidence for which is rarely preserved in giant ocean island collapse scars.