

El Golfo collapse

The growth of large volcanoes is commonly interrupted by episodes of flank collapse that may be accompanied by catastrophic debris avalanches, explosive eruptions, and tsunamis.

El Hierro, the youngest island of the Canary Archipelago, has been repeatedly affected by such mass-wasting events in the last 1 Ma.

Field observations and petrological data suggest that the largest and most recent of these flank

collapses — the El Golfo landslide — likely influenced the magma plumbing system of the island, leading to the eruption of higher proportions of denser and less evolved magmas. The results of numerical simulations indicate that the El Golfo landslide generated pressure changes exceeding 1 MPa down to upper-mantle depths, with local amplification in the surroundings and within the modeled magma plumbing system. Stress perturbations of that order might drastically alter feeding system processes, such as degassing, transport,

differentiation, and mixing of
magma batches.

The effects of flank collapses on volcano plumbing systems

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