



## Reconciling the location of lava domes and eruption centers in Paleocene-Eocene calderas in northern Chile

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In the Atacama Desert, at the Precordillera of northern Chile, a series of Paleocene-Eocene caldera deposits and ring-faults are exceptionally well-preserved<sup>1</sup>. Here we aim to build on previous mapping efforts to consider the location, timing and style of pre, syn and post caldera volcanism in the region. We focus on the partially nested caldera complexes of Lomas Bayas and El Durazno<sup>2,3</sup> where deposits record several stages of caldera evolution (pre-collapse, collapse/intra-caldera and extra-caldera, resurgence and post-collapse eruptive deposits). The pre-caldera basement is a thick sequence of early Paleocene mafic lavas<sup>4,5</sup>. The caldera complex formed between around 63 and 54 Ma<sup>4,5</sup>. Both calderas constitute subcircular structures approximately 13 km in diameter and are cut by several NNW to NNE-trending felsic dikes which are spatially related to felsic domes interpreted as resulting from post caldera formation unrest<sup>1,4</sup>. These calderas have been interpreted as part of the Carrizalillo megacaldera complex<sup>2</sup>. We combine field observations, such as the attitude of dikes, as well as information on their dimension and composition, the size, location and composition of domes and lava flows, as well as the evidence of the regional stress field operating during the caldera evolution from measurements of fault kinematics. This data will be used as the input to finite element method models to investigate the effect of nested caldera geometry, ring-faults and crustal heterogeneities on the location of domes and eruptive centers generated during caldera unrest. The results will be potentially useful for constraining models of eruption forecasting during periods of unrest in calderas and ore deposition models which have been shown to be linked to caldera structure and magma emplacement.

### References

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