Cordilleran Section - 116th Annual Meeting - 2020

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LONG-LIVED SUBDUCTION AND POST-SUBDUCTION VOLCANISM AND INCISION IN THE SIERRA SAN FRANCISCO, CENTRAL BAJA CALIFORNIA PENINSULA, MEXICO

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Miocene arc volcanoes erupted along the length of the central Baja California peninsula with a notable gap of about 65km at San Ignacio in the state of Baja California Sur. Reconnaissance mapping north of the San Ignacio gap reveals eroded arc stratovolcanic core and medial facies of the well-known Comondú Formation. These Miocene (22-12 Ma) andesitic and dacitic intrusive domes, peléean domes, lavas, block-and-ash-flow deposits and lahars make up the bulk of the 1400 m-high Sierra San Francisco (SSF) that forms the topographic spine of the peninsula. In this part of Baja California Sur, stratovolcano cores host broad erosional, amphitheater valleys, including the Santa Martha valley (7x7 km) within the SSF, 29 km N of San Ignacio, and the El Tajo valley (13x16 km) within the Sierra Santa Lucia, 45 km ESE of San Ignacio. These valleys may be the result of preferential near-vent hydrothermal alteration and erosion.

The Comondú Formation in the SSF forms an oblong NNW-elongate and deeply-eroded major volcanic center with gentle radial dips. The SSF Comondú volcanic center is cut by series of NNW-striking, largely E-side down normal faults with only 10s of m of slip. Post-subduction (~11-3 Ma) basaltic to andesitic lavas overlie the Comondú Formation and locally postdate the normal faulting. These lavas erupted from numerous and widely-distributed monogenetic scoria cones and lava domes that coincide with and extend beyond the area of Comondú vents. The late Miocene-Pliocene vents align with many of the NNW-striking normal faults, but are generally not offset by the faults. Mafic to intermediate lavas erupted after substantial erosion of the Comondú deposits, flowed radially outward across the SSF and are commonly inset in paleovalleys eroded into the Comondú Formation. The late Miocene-Pliocene scoria cones are largely removed by erosion and expose a network of local feeder-dikes that, in-part, align with the underlying NNW-striking faults. Subsequent erosion has continued to incise through the inset Miocene-Pliocene lavas and carve deeper canyons into underlying Comondú deposits, suggesting a significant component of post-Pliocene incision. Further mapping will help unravel the relative contributions of rift flank uplift and magma emplacement to the post-subduction uplift and incision history of the mid-peninsula.

Session No. 18

D8. The Origin and Spatiotemporal Evolution of Arc Magmas Recorded From Mineral to Plate-Boundary Scales I
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