

THE COASTAL CORDILLERA/PRECORDILLERA BOUNDARY: A NEW CONTINENTAL SCALE, LONG-LIVED, MARGIN-PARALLEL STRUCTURAL SYSTEM IN THE ATACAMA REGION, NORTHERN CHILE

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In the Atacama region, northern Chile, two continental scale, long-lived, margin-parallel structural systems stand out as the most prominent structural features of the Coastal Cordillera and Precordillera: the Atacama Fault Zone (AFZ) and the Domeyko Fault Zone (DFZ) respectively. Evidence from structural geology, magmatism and economic geology has emerged about the existence of another margin parallel, structural system located between the AFZ and the DFZ at the boundary between the Coastal Cordillera and the Precordillera (CCPB). The evaluation of the CCPB in Tierra Amarilla (26°28'S-70°15'W) and in Inca de Oro (26°45'S-69°55'W), indicates that this structure acted as a strike-slip shear zone, constituted a channel for the ascent of magma and offered a pathway for mineralising fluids. This makes it a distinctive tectonic element in the overriding plate during the mid- to Early Cretaceous (c. 119 - 78 Ma) comparable with the AFZ and the DFZ. Extensional high and low angle structures (119-93 Ma) were softened by the thermal effect of high level syntectonic plutons and mylonitic bands were generated. Late (93-78 Ma), mainly brittle contractional structures displaced and reworked the previous structures. An en echelon alignment of positive flower structures evolved as a narrow zone of crustal uplift whose deformation developed in regime of left-lateral transpression. NNW brittle, left-lateral, strike-slip structures were active during the activity of the extensional and contractional structural systems. They acted as locus of magma emplacement allowing roof uplift during the extensional phase, accommodated differential shortening during the transpression and permitted clockwise rotation of Coastal Cordillera blocks.