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Title: METALO-TECTONIC ANALYSIS OF THE MESO Ñ CENOZOIC OF COLOMBIA

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Abstract: The metallogenesis of the Northern Andean Block (NAB) and especially Colombia, is little documented. The present interpretation is supported by regional tectonic models by Cediel *et al.* (2003). Meso-Cenozoic tectonic evolution developed upon and along the western margin of a heterogeneous basement which included felsic Precambrian gneiss and early Paleozoic autochthonous and allochthonous metamorphic rocks, dominated by chemically reduced metasedimentary units including graphitic schist, meta-pelite, quartzite, marble and amphibolite. The basement complex has been strongly tectonized and fragmented by pre-Andean and Andean-aged orogenic events.

Permo-Triassic to Early Cretaceous: During the late Paleozoic - early Mesozoic, northwestern : South America was affected by regional taphrogenesis during the separation of North and South America and the opening of the Caribbean basin. Rifts formed in the Permo-Triassic, Jurassic and early Cretaceous, whilst calc-alkaline magmatic arcs and back-arc basins formed in the Jurassic, resulting in the genesis of various syngenetic and epigenetic deposit types including Red-Bed Cu (Ag), Besshi-type Cu (Ag-Zn), Shale-Hosted Zn (Cu-Pb), mesothermal and epithermal hydrothermal veins and porphyry-associated Au-Ag-Cu-Mo (Pb, Zn). Erosion of mineralization contained within the Jurassic magmatic arcs gave rise to widespread alluvial gold exploited in numerous historic districts.

Late Cretaceous and Cenozoic: Northwestern South America underwent a general tectonic reorganization in the early Cretaceous. With respect to the NAB, the resulting tectonic regime was strongly dextral transpressive, driven by the approach, collision and accretion of allochthonous oceanic terranes of Pacific provenance, closely linked to the passage/emplacement of the Caribbean plate. With respect to regional metallogeny: 1) *in situ* syngenetic submarine exhalative deposits typical of extensional environments (e.g. Red Bed, Besshi, SEDEX) are no longer recorded, 2) abundant autochthonous (formed *in situ*) epigenetic hydrothermal deposits associated with calc-alkaline magmatic arcs of various ages are observed, and 3) allochthonous deposits formed in intra-oceanic environments and later accreted to the continental block are documented.

Various regional-scale parameters have influenced the metallogenic expression of the NAB: 1) the Paleozoic basement and Pacific terranes contain chemically reduced rock-types which have had a reducing effect upon intrusions and related hydrothermal systems, 2) *in situ* magmatic arcs of various ages were formed under conditions of dextral-oblique \ low angle compression \ subduction, 3) considering the allochthonous deposits, all important systems are hosted within the Cañas Gordas terrane, the only oceanic terrane to have developed calc-alkaline magmatic arcs, and 4) due to the highly aggressive (accretionary) nature of Meso-Cenozoic tectonism, important structural control upon the magmatic and hydrothermal evolution of epigenetic mineralisation is observed.

Reference Cited

Cediel F., R.P. Shaw and C. Cáceres, 2003, Tectonic Assembly of the Northern Andean Block, *in* Bartolini, C., R.T. Buffler, and J. Blickwede, eds., *The Circum-Gulf of Mexico and Caribbean: Hydrocarbon habitats, basin formation, and plate tectonics: AAPG Memoir 79*, p. 815 - 848