Metallogeny of the Labrador Central Mineral Belt

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The Labrador Central Mineral Belt consists of six Proterozoic supracrustal sequences: the Moran Lake, Lower Aillik, Upper Aillik, Bruce River, Letitia Lake and Seal Lake groups. These sequences range in age from ca. 2000 Ma to ca. 1300 Ma and occur in a 260 x 75 km area in central to coastal Labrador. Each sequence has a unique style and type of metallic mineralization. The Lower Aillik Group (>1860 Ma) hosts scattered U occurrences, including the Kitts Deposit, that have been described as syngenetic with host graphitic metasedimentary and mafic volcanic rocks. The Moran Lake Group (>1860 Ma) contains massive sulphide occurrences in basal shales, shear zone-hosted U occurrences in basalts, and epigenetic (Grenvillian) galena and sphalerite-bearing quartz-carbonate vein systems along the unconformity between this group and Archean basement granitoid rocks. Within the mainly felsic volcanic rocks of the 1860 Ma Upper Aillik Group there are two styles of U mineralization: one type was the product of synvolcanic leaching within the felsic volcanic pile, and the second resulted from post-tectonic (ca. 1650 Ma) granitic intrusions. There are also molybdenite, fluorite, and galena occurrences associated with the post-tectonic granites resembling porphyry systems. The 1650 Ma Bruce River Group contains a basal sedimentary sequence with strongly carbonatized U-bearing shear systems and an upper, mainly felsic, volcanic sequence also with U in shear zones. Both sequences contain Cu occurrences in late fault and fracture systems. The peralkaline felsic volcanic rocks of the 1327 Ma Letitia Lake Group contain syngenetic massive sulphide and epigenetic shear zone sulphide occurrences. Associated syenitic intrusions host Nb-Be and REE mineralized zones. The youngest supracrustal sequence (ca. 1300 Ma), the Seal Lake Group, hosts over 250 copper (with variable silver and molybdenum) epigenetic vein occurrences ranging from native copper in slates through chalcocite and bornite in diabase sills and basalt flows.