Gold environments in New Brunswick

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Exploration in the vicinity of recently discovered gold occurrences, and additional exploration in areas containing known gold mineralization, has highlighted the potential for economic precious metal deposits in New Brunswick. Gold has been documented in nearly all the main tectonostratigraphic zones in the province in units ranging in

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age from Neoproterozoic to Carboniferous. Although research on most occurrences is limited, generalized unifying models depicting gold environments in some regions of the province can be established utilizing available information. The majority of occurrences are either directly or indirectly related to magmatism in plutonic and volcanic environments; some are strictly structurally controlled (metamorphic), and others are associated with volcanic-hosted massive sulphide deposits.

In southwestern regions of the province, Lower Devonian, intermediate to felsic intrusions that produce contact metasomatic (skarn?) and porphyry mineralization are also likely source rocks for numerous, mesothermal, quartz/carbonate vein systems. The latter probably represent eroded high sulphidation-type epithermal deposits. In central and northeastern regions, gold in similar environments is associated with Siluro-Devonian and Ordovician, felsic to mafic intrusions. These intrusions may have also generated the base-metal sulphide- and gold-bearing occurrences that are present in the Siluro-Devonian, shallow subaqueous volcanic sequences in these regions. The structurally-controlled types, without any obvious magmatic source, are most prevalent in, but not restricted to, Neoproterozoic to Cambrian units along the Bay of Fundy shore. Like the occurrences in the southwestern region, these may also be the roots of high sulphidation, epithermal systems. Gold occurrences associated with deep subaqueous exhalite and stringer zone sulphides are restricted to northeastern regions, i.e. the Ordovician Bathurst Mining Camp.

Several other types of gold environments are represented in the southern part of the province. Intrusion-related hydrothermal breccias appear to be associated with Late Devonian, high-silica granite and may represent low sulphidation epithermal systems. Paleoplacers and possible subareal geothermal systems are associated with Carboniferous fluvial sedimentary sequences. Gold enrichment has been documented in recent peat bogs overlying these Carboniferous rocks.

Currently, the most intensive exploration is focused on promising occurrences intimately associated with the Lower Devonian and Ordovician (?) intrusions in southwestern and central regions. The exploration potential of extensive Carboniferous sedimentary basins is just beginning to be evaluated and the Neoproterozoic terranes of southern New Brunswick should have similar potential to those in Newfoundland and to the gold districts in the Carolina Slate Belt.