
Tectonostratigraphy of ophiolite and volcanic cover, Baie Verte Peninsula, Newfoundland

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The Baie Verte Peninsula is underlain by Cambrian to Ordovician rocks of the Laurentian continental margin and lower Ordovician ophiolites, locally hosting VMS mineralization, that were thrust onto the margin during the Taconian orogeny. The ophiolites are covered by a lower Ordovician mafic-felsic volcanic sequence. Uplift and erosion of the accretionary continental margin and its cover was followed by lower Silurian continental volcanism prior to the onset of the Salinic orogen and younger strike-slip deformation.

The Betts Cove ophiolite complex and overlying Snooks Arm Group comprise a well preserved stratigraphic record of ophiolite and volcanic cover formation on the Baie Verte Peninsula. The ophiolite comprises ca. 489 Ma mafic and ultramafic cumulates, sheeted dykes and pillowed, boninite lavas. Overlying intermediate TiO₂ boninites and plagioclase-phyric island arc tholeiitic basalts host Cyprus-style VMS mineralization, and are locally capped by ophiolite-derived conglomerate. Local tilting and erosion was followed by deposition of the Snooks Arm Group comprising jasper-bearing cherts and conglomerate (Nugget Pond Horizon), intermediate volcanoclastic rocks and tholeiitic basalts, cpx-megaphyric andesite and dacite tuff. Volcanic-derived turbidities are overlain by tholeiitic, high TiO₂ basalt, graptolitic black shale, ca. 467 Ma rhyolite and tholeiitic OIB basalt and talus breccia. The lower Pacquet Harbour Group to the west has ophiolitic affinities and comprises boninite pillow lavas overlain by island arc tholeiitic basalt and felsic volcanic rocks dated at ca. 487 Ma (with 1 and 2.6 Ga inheritance) that host the Rambler and Ming mine VMS deposits. These are locally capped by red cherts and overlain by a cover sequence of volcanoclastic rocks and high-TiO₂, plagioclase phyric tholeiitic basalts, felsic tuffs and volcanic-derived turbidites. The Pointe Rousse Complex comprises dismembered ophiolite including serpentized harzburgite, ultramafic and mafic cumulates, sheeted dykes and pillowed boninites and low TiO₂ tholeiitic basalts. It is covered by a red jasper iron formation (Goldenville Horizon), intermediate volcanoclastic rocks, a cpx-megaphyric andesite tuff breccia, and high TiO₂ tholeiitic basalts and ca. 482 Ma gabbro. To the west, the Advocate Complex comprises mantle harzburgite, ultramafic and mafic cumulates and sheeted dykes. The upper ophiolite section is largely missing and is overlain by ophiolite-derived conglomerate and megaconglomerate of the lower Flatwater Pond Group. These are overlain by plagioclase-phyric pillow basalts, cpx-megaphyric mafic tuff, and felsic volcanic

rocks locally dated at ca. 476 Ma with 1 Ga and 2.6 Ga inherited components. We propose that 489–487 Ma ophiolite crust was obducted onto the eastward-tapered margin (present) resulting in erosion later followed by continental margin volcanism between ca. 482 and ca. 467 Ma.