

### Carboniferous Faulting, Deformation and Igneous Intrusion in the Western Cobequid Hills

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Igneous rocks of the western Cobequid Hills preserve a record of complex tectonic events of Devonian-Carboniferous age. A series of granitoid plutons with minor gabbros are intruded just north of the Cobequid Fault. Rb/Sr isochrons yield ages of 340 to 356 Ma. These plutons appear intruded at a high structural level and show the geochemical character of within-plate (rift-related) granites.

Much of the Cape Chignecto pluton at the western end of the Cobequid Hills is moderately to highly mylonitically deformed with a foliation that generally dips gently north or south and an approximately north- or south-trending mineral lineation. Available kinematic indicators indicate a consistent northward sense of overthrusting. Similar moderate deformation occurs at the extreme southern margin of plutons west of the Cape Chignecto pluton and is characterised by an east-west trending mineral lineation. The North River and West Moose River plutons also

have flat-lying, brittle thrust zones marked by mafic sills.

The Fountain Lake Group volcanics of the western Cobequid Hills yield similar isochron ages to the plutons; are similar geochemically; and nowhere are in intrusive or unconformable contact with the plutons. These volcanics are interpreted as extrusive equivalents of the plutons. They show only minor brittle deformation.

Sets of dykes, some composite mafic and felsic, intrude some of the plutons, and in some cases are deformed along with the host granite. These dykes are geochemically similar to the Fountain Lake volcanics. Dyke sets of similar composition cut Late Precambrian basement rocks near the Cobequid Fault and locally pass into sills. Most are undeformed, but locally are cut by small thrust faults or show mylonitic deformation. Dyke orientations are interpreted as related to motion on the Cobequid Fault. Locally, dyke complexes mark the filling of extensional

pull-aparts along the Cobequid Fault.

The localization of rift-related plutons of Early Carboniferous age along the Cobequid Fault reflects a fundamental extensional environment, in which rapid rise of mafic magmas was also possible. The great extent of mafic plutons in the central Cobequids may reflect greater pull-apart, associated with the

intersection of the Hollow and Cobequid Faults. Dyke sets are common only within a few kilometres of the Cobequid Fault. They and the plutons appear associated with the Fountain Lake volcanics. Local compression is indicated by the mylonitic deformation of the Cape Chignecto Pluton, and the abundance of small thrusts offsetting granitic sills.