Drift prospecting studies were conducted in the Mount Polley Mine region, integrating surficial mapping, paleoflow measurements and Quaternary stratigraphy to infer glacial history. Eighty seven till samples were taken with the objective of determining the geochemical and mineralogical dispersal in till down-ice from Mount Polley. Surficial mapping identifies till as the most abundant surficial material. Colluvium is mapped at high elevations and steep slopes, and glaciofluvial and alluvial sediments are widespread in the river valleys. The stratigraphic record documents till associated with Fraser Glaciation followed by retreat phase glaciolacustrine and glaciofluvial sediments. Two distinct ice-flow movements have been identified; an initial west, southwestward flow during glacial advance, followed by a northwestward flow. The till sampling survey identifies mineralized glacial dispersal up to 10 km to the northwest, Hg and Zn as pathfinder elements and apatite, andradite, chalcopyrite, epidote, gold grains and jarosite as porphyry indicator minerals (PIMs).