PRELIMINARY RESULTS OF THE PETROLOGICAL-GEOCHEMICAL COMPONENT TO THE BATHOLITHS PROJECT

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The petrologic/geochemical component to the BATHOLITHS project is designed to gain quantitative insights into the processes active during batholith generation. Petrologic and geochemical studies of arc-related, igneous and meta-igneous rocks along two proposed transects (Dean and Douglas Channels) will be carried out in this project to resolve: (1) the bulk chemistry of the exposed part of the arc, (2) the depth of generation of granitoid plutons and the need for, or lack of an "eclogite facies" residue, (3) relative fractions of partial melt generated from crustal and mantle-derived rocks, and (4) temporal changes in chemical and isotopic patterns that might be correlative with tectonic processes such as crustal thickening and/or delamination. Sample collection, therefore, is focused on plutonic suites and mafic (mostly basaltic) dikes and rare lava flows that range in age from mid-Paleozoic through recent. Samples collected for this part of the project are analyzed for major, trace, and rare earth elemental, as well as, Sm-Nd, Rb-Sr, Pb-Pb, and oxygen compositions.

Herein we present the preliminary results of the petrologic and geochemical study of samples collected from the Dean Channel transect of Coast Plutonic Complex, British Columbia. Samples from this transect were collected from a region that spans from the Bella Coola area to the Bella Bella/Shearwater area and include at least 14 distinct plutonic suites (31 samples), and seven dikes. Crystallization ages (U/Pb zircon) are being determined by single crystal techniques for 13 of the plutonic samples and by Ar-Ar techniques (whole rock and Hbl) on all of the dikes. Plutonics sampled in this transect appear to range in age from Jurassic to Miocene and their chemical compositions provide constraints on the evolution of lower crustal source regions with particular emphasis on relative depth to source. Sampled dikes and lava flows are all mid to late Cenozoic and were collected to provide constraints on the evolution of their upper mantle sources. In particular, these samples were collected to assess any influx of asthenospheric mantle that may indicate a root foundering event.