Constraining the timing and magnitude of extension along the southern section of the Okanagan Valley Fault, southern B.C.

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Within the southern Okanagan Valley, medium- to high-grade metamorphic rocks are juxtaposed against nearly pristine volcanic and sedimentary rocks. Previous work has demonstrated that the nature of the boundary between these two disparate packages of rock is predominantly a <1 km-thick ductile shear zone, termed the Okanagan Valley fault (OVF). The shear zone grades abruptly from cataclasite to mylonite in amphibolite-grade gneiss, which, along with younger granitic intrusions, has undergone polyphase deformation and shows evidence of significant flattening. Linear fabric elements and kinematic criteria (e.g., rotated porphyroclasts, boudinaged pegmatite dykes, sheath folds, C/S fabrics) strongly indicate extensional motion through which the hanging-wall has moved to the west.

Farther to the north, within the central portion of the OVF, recent work has attributed minimal displacement to the OVF and brought into question previous estimates for the magnitude of extensional displacement as determined to the south (~45-90 km) and north (~32 km). The apparent disparity in the estimated magnitude of extension along the trace of the OVF may provide insight into the along-strike variation in displacement along a fault such this, and/or require a revised interpretation of the tectonic nature of this shear zone. To help address this problem, it is imperative to reexamine the southern portion of the OVF as little work has been done in the last 20 years. In order to better understand the nature of the OVF and constrain motion along the southern portion of the shear zone, we intend to conduct a comprehensive thermo-structural analysis. This work will comprise 1:50 000 scale mapping and strain analysis to constrain the dimensions and geometry of the shear zone. This study will be complemented by petrography, geothermobarometry, U-Pb geochronology (e.g., *in situ* dating of metamorphic and fabric-forming minerals) and thermochronology to constrain the P-T-t path and rate of exhumation related to extension. Lastly, geochemistry of the gneissic rocks within the footwall will be used in an attempt to identify their protolith.