

Detrital Zircon U-pb Geochronology of the Late Devonian Earn Group: Implications for Paleodrainage Reorganization in NW Canada During Renewed Subduction

Emilia Caylor¹, Kenneth Hickey¹, Shaun Barker¹

¹University Of British Columbia, , Canada

The Late Devonian–Early Mississippian marks the onset of subduction-related processes and assembly of the accretionary margin in northwestern Canada. Eastward subduction of Panthalassa oceanic crust beneath northwestern Laurentia generated an extensional back-arc system, separating the Yukon-Tanana terrane from the continent as the Slide Mountain Ocean opened. Back-arc extension in the upper crust renewed subsidence along the continental margin within the Selwyn Basin, resulting in deposition of the Earn Group clastic marine rocks in present-day Yukon and Northwest Territories and northern British Columbia. Despite its significance, the sediment provenance and paleogeographic origin of these back-arc basin strata remain poorly understood due to sparse data. We present new detrital zircon U-Pb geochronology results from the Earn Group collected along strike of the paleo-continental margin in the Yukon Territory and northern British Columbia to resolve paleodrainage reorganization of in response to this tectonic shift. Dominant age populations at 1.4–1.1 Ga, 2.0–1.8 Ga, and >2.5 Ga reveal a diverse provenance signature inconsistent with derivation solely from recycled local continental margin strata, as previous studies propose. Age populations share a similar source signal to clastic wedge strata derived from mid–late Paleozoic Arctic orogenic belts (i.e. Franklinian, Ellesmere, Innuitian), suggesting that paleodrainage networks supplying the Selwyn Basin may have extended further northeast into the paleo-Arctic realm.