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Title: TRIASSIC STRATIGRAPHIC LINKS BETWEEN PERICRATONIC TERRANES OF THE NORTHERN CANADIAN CORDILLERA AND THE NORTH AMERICAN MARGIN: A NEW TECTONIC AND PALEOGEOGRAPHIC MODEL FROM DETRITAL MINERAL AND WHOLE-ROCK PROVENANCE DATA

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Abstract: The northern Canadian Cordillera records a protracted history of discrete collisional events representing the accretion of allochthonous terranes of both pericratonic and exotic affinities to the ancient Pacific margin. The accepted tectonic model suggests the earliest terrane accretion is Early to Middle Jurassic in age; however, evidence for the timing of convergence between these terranes and North America is obscured by Jura-Cretaceous allochthons that cover rocks of the initial collision zone.

We utilize the Mississippian to Triassic sedimentary record of the Selwyn basin, the outer Cordilleran passive margin in Yukon, to investigate the timing of accretion of the Yukon-Tanana terrane (YTT), the easternmost and largest pericratonic terrane in the Cordillera. New provenance analyses of these strata demonstrate that Early to Late Triassic sedimentary rocks contain middle Paleozoic detrital zircon and mica populations that are unique to and diagnostic of the YTT. Nd isotopes and trace element geochemistry of Triassic strata show complex mixing between isotopically primitive and evolved source rocks. These data are not compatible with Triassic rocks of the northern Cordilleran margin having been derived solely from the Laurentian craton to the east. Rather, they indicate that Early Triassic and younger sedimentary rocks of the Selwyn basin have a source component from the YTT to the west. We interpret these data to record an early Mesozoic stratigraphic link between the YTT and North America, which requires a pre-Early Triassic accretion event. We therefore argue that the Triassic sedimentary rocks of the Cordilleran margin in Yukon were deposited within a collision-related peripheral foreland basin. The accommodation space for this flexural basin, superimposed on the

Selwyn basin, was generated by the tectonic loading of the YTT (upper plate) onto the outer margin of North America (lower plate).

A pre-Early Triassic event between the YTT and North America has paleogeographic and tectonic implications for other terranes in the northern Cordillera. Previous workers have documented that late Paleozoic rocks of the YTT in southern Yukon are equivalent to the Lay Range and Harper Ranch assemblages of British Columbia, and that the YTT represents, at least in part, basement to the Mesozoic Quesnellia terrane. Triassic conglomerate of the west-central YTT has a provenance from Pennsylvanian (300-317 Ma) igneous rocks of the Semenof block, which is thought to represent late Paleozoic basement to Mesozoic Stikinia. Middle Triassic rocks of the Selwyn basin also contain abundant 300-317 Ma detrital zircons, possibly suggesting a Middle Triassic collision between the YTT and Stikinia to the west, which led to sediments being shed eastwards across the YTT, and into the newly-developed peripheral foreland basin. Therefore, by Middle Triassic time the composite YTT-Quesnellia-Stikinia complex had been accreted to the North American margin in Yukon.