

## Paleozoic facies relationships across central Kechika trough (NW Rocky Mtns.) preclude possibility of cryptic Cretaceous suture or mega-fault

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The Kechika trough developed as an intracratonic basin near the western margin of Laurentia in Cambrian through Devonian time. It passes northward across the Liard line into the broader Selwyn basin in the Yukon. The Liard line is a margin-normal structure interpreted as a transfer zone between a lower-plate rifted margin to the north and an upper-plate rifted margin to the south. Attempts to account for anomalously shallow paleomagnetic inclinations observed in stratified rocks farther west incorporate “ribbon continent” models, requiring the existence of a Cretaceous ocean-consuming suture and/or continent-scale transcurrent dextral fault along the axial region of the trough. Here, we evaluate these hypotheses based on 1) detailed (1:50,000 scale) outcrop geological mapping of the central portion of the trough and 2) measured stratigraphic sections focused on Cambrian strata east and west of the trough axis. Although imbricated by Mesozoic thrust faults, Cambrian through Devonian strata occur in continuous depositional sequences in which most units show shallower/proximal to deeper water/distal to shallower/proximal progressions from east to west. Distal shale-argillite-chert facies of the Ordovician-Middle Devonian Road River and Middle to Upper Devonian Earn groups include minor quartzose siliciclastic beds that reflect continental derivation. No non-continental sedimentary sequences, oceanic crust-mantle remnants, or high-strain zones are observed in the axial region of the trough.

Distinctive Middle Cambrian maroon polymictic conglomerates of the Roosevelt Formation are recognized in sections on the eastern and western sides of the trough between 58° and 59°N. Although correlative strata are not recognized elsewhere along the western Laurentian margin, these rocks record the last episode of earliest Paleozoic rifting along this margin that began in the Early Cambrian. Roosevelt conglomerates are attributed to an early stage of syn-rifting graben development within the trough. Pre-thrusting reconstruction of the trough region involves restoration of motion on individual thrust faults (typically  $\leq 10$  km) and retention of the contiguous distribution pattern of the Roosevelt Formation. Total SW-NE shortening across the trough was  $< 100$  km. Maximum lateral displacement that retains contiguity of eastern and western Roosevelt conglomerate facies is also ca 100 km, with probable displacements considered much less. All the above considerations render the Kechika trough an unlikely site of Cretaceous terrane accretion. Rather, it provides a rich record of successive episodes of Paleozoic extension, from Rodinia breakup through Devonian back-arc lithospheric thinning; followed by Jurassic-Early Cretaceous development of the northern Rocky Mountain fold and thrust belt.