

Episodic Proterozoic Rifting of Western Laurentia

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In Proterozoic time, a large portion of ancestral North America, commonly referred to as Laurentia, was part of a larger, evolving mega-continent known variably as Arctica, Nena, Kanatia and Rodinia. Models and nomenclature for this evolving landmass are still being developed. Northwestern Laurentia may have been firmly attached to the Australian craton in the Early Proterozoic, as a consequence of a shared collisional event at ca. 1.85-1.95 Ga that produced the Wopmay orogeny in Canada and the Barramundi orogeny in Australia. Following these orogenies, western Laurentia underwent at least four discrete rift events. The first occurred in Yukon Territory where the Wernecke basin (ca. 1.84-1.72 Ga) formed and filled with ~13 km of clastic and carbonate strata. Subsequent rift events are recorded by the Belt-Purcell basin (1.47-1.37 Ga) of southern British Columbia and the northwestern United States; the Pinguicula basin of Yukon (ca. 1.38 Ga); the Hematite Creek, Mackenzie Mountains, and Buffalo Hump basins of Yukon and the northwestern U.S.A. (ca. 1 Ga); and the Windermere basins (0.8-0.6 Ga) that extend from Yukon to the southwestern U.S.A. The prominent Muskwa basin of northern British Columbia may correlate with any of the pre-Windermere successions. All of these rift assemblages are thick (1-13 km) and, overall, contain little igneous rock. Most, if not all of the pre-0.8 Ga rift basins appear to be intracratonic features, apparently recording episodic, failed extension prior to the Neoproterozoic when Windermere-aged rifting succeeded and led to continental separation and dispersion.