

# **Evolving Depocentres and Depositional Systems in Cenomanian-Turonian (Dunvegan, Kaskapau and Blackstone) Strata, Alberta and British Columbia: Responses to Cordilleran Tectonic Activity**

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## **Abstract**

Deltaic strata of the lower Dunvegan prograded southeastward along the axis of the foreland basin and filled a pre-existing flexural depocentre in the NW. Upper Dunvegan strata record inception of a new depocentre in the west that filled with alluvial strata, progressively starving deltaic and marine environments of sediment. The Kaskapau Formation shows an abrupt switch to marine conditions as accommodation exceeded supply. Lower Kaskapau rocks have a prismatic, strongly wedge shape with isopach trends that oscillate between NW-SE and N-S trends. This pattern suggests thrust sheets advancing from the SW and W. A basin-wide unconformity at the top of the Pouce Coupe sandstone may indicate internal thickening of the accreting wedge and tilting of the basin. Middle and Upper Kaskapau/Blackstone isopachs trend broadly NW-SE, and strata are progressively less wedge-shaped upward; overlying Cardium strata are broadly tabular. These geometries indicating a progressive decrease in subsidence rate and ultimately cessation of flexural subsidence in the north. Decreasing subsidence rate is also recorded by progressively increasing distances of shoreline and conglomerate progradation.

Localised changes in the trends of isopachs appear to coincide with some Archean terrane boundaries, which may have experienced differential flexure in response to loading. The late Dunvegan-early Kaskapau pulse of flexural subsidence is coincident with uplift and erosion over a forebulge that was located about 400 km from the deformation front. Erosion over this forebulge is less evident in the upper Kaskapau/Blackstone, possibly in response to Turonian eustatic rise.