

## **Dawson Creek Graben Complex: growth-faulted soil-imprinted estuarine facies - Carboniferous Stoddart Group, Alberta/BC**

J.E. Barclay\*  
Ice Energy Limited  
1000 717 7<sup>th</sup> Avenue SW, Calgary, Alberta T2P 0Z3  
<mailto:jbarclay@iceenergy.ca>

and

F.F. Krause  
Department of Geology and Geophysics, University of Calgary  
2500 University Drive NW, Calgary, Alberta T2N 1N4

Subsurface stratigraphic analysis of the Stoddart Group and overlying Belloy Formation reveals the sedimentary and regional structural evolution of an E-W Carboniferous-Permian graben complex developed on the “stable” cratonic platform. The graben forms the block-faulted core of a broad craton-marginal Carboniferous-Triassic NW-trending downwarp (the Peace River Embayment). The graben was very long-lived (100 million years), overlies uplifted Precambrian basement (Peace River Arch), and was downwarped along NW and NE high-angle normal growth faults. Estuarine clastic deposition kept pace with growth faulting such that the graben sea-floor topography was generally flat.

Stoddart strata (mainly late Late Viséan) can be divided into four "Depositional Sequences": Golata Formation quiet offshore marine mudstones with an incised soil-imprinted upper surface, a basal Kiskatinaw Formation sandy estuarine valley-fill complex, a lower to upper Kiskatinaw Formation shallow shelf with interbedded tidal mudstones, sandstones and lime mudstones with abundant paleosols and a Taylor Flat Formation (Serpukhovian) carbonate-dominated open marine shelf.

The graben complex controlled sedimentation patterns by providing a rapidly subsiding sediment sink that filled continually with persistently shallow marine and heavily soil-imprinted clastics. The graben geometry focused tidal energy and suppressed wave and storm energy resulting in tide-dominance and also localised an incised valley system during a large relative sea-level drop and localised a mega-estuary during a subsequent relative sea-level rise. Eastward subsidence migration and subsidence pattern changes in the graben suggest that episodic orogenic activity occurred to the west analogous to the Devonian-Carboniferous Antler Orogeny or other western U.S.A. events.