Fluvial Seasonality: A predictive tool for deciphering the sedimentological complexity of inclined heterolithic stratification deposited on large - scale tidal – fluvial point bars?

Bryce V.J. Jablonski[1] **and Robert Dalrymple**[2]

[1]*Heavy Oil Technology Centre, Statoil Canada, Calgary, Canada*
[2]*Department of Geological Sciences and Geological Engineering, Queen's University, Kingston, ON, Canada*

Abstract

The lower Cretaceous (Aptian-Albian) McMurray Formation is known for its world class examples of Inclined Heterolithic Stratification (IHS; Thomas et al., 1987). This alternation of sand and mud is volumetrically significant within the McMurray Formation, particularly when dealing with large tidal-fluvial point bars that typify parts of the McMurray. Understanding the distribution and character of IHS is, therefore, fundamental to in-situ extraction techniques (i.e., Steam Assisted Gravity Drainage-SAGD; Cyclic Steam Stimulation-CSS) of the McMurray oil sands, due to the negative impact of reservoir heterogeneity and importance of vertical permeability (Kv) (Strobl, 2012) on these recovery methods. Outcrops along the lower Steepbank River in northeastern Alberta, Canada, provide excellent 2-dimensional (and pseudo 3-dimentionsal) exposures of IHS formed on a tidal-fluvial point bar. Further investigation of these outcrops allows us to understand the depositional complexity associated with IHS sedimentation better.