

Speciation of McMurray Formation Inclined Heterolithic Strata: Varying Depositional Character Along a Riverine Estuary System

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ABSTRACT

Within the McMurray Formation, the sedimentological and ichnological character of Inclined Heterolithic Stratification (IHS) deposits exhibit considerable variability. Ichnology has played a key role in resolving the dynamics of IHS deposition, helping to illuminate the link between variation in sediment character, and temporal and spatial variation in water circulation and sediment flux. An integration of IHS depositional character with studies of modern riverine estuaries has yielded a depositional model linking IHS character with position along the estuarine gradient.

IHS character falls into a broadly tripartite distribution, with a sand-dominated seaward flux in the upper reach, a fine-grained zone of convergent flux in the middle reach, and sand-dominated landward flux in the lower reach. The sand dominated IHS deposits from each end of the system contrast strongly in terms of texture, structure, biogenic signature, and stratal organization.

Example intervals representative of different “species” of IHS are presented, with emphasis placed on their contrasting character, and what this reveals about temporal and spatial variation of sedimentation within a conceptual McMurray riverine estuary.