Sequence Stratigraphy of a Regional Deep-Water Marker Horizon: The Neoproterozoic Old Fort Point Formation, Southeastern Canadian Cordillera

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Depositional & Petroleum Systems: Deep-Water Clastics

The Neoproterozoic Old Fort Point Formation (OFP) is a widespread unit, locally exposed over 35,000 km^2 of the southeastern Canadian Cordillera and forms a key stratigraphic marker within the Windermere turbidite system. The OFP was deposited along an ancient basin-slope to basin-floor transect and offers a unique opportunity to examine stratigraphic architecture of condensed unit in a deep-water setting. The lower member of the OFP comprises variably coloured fine-grained siltstone that grade upward to a carbonate + carbonate-rich siltstone rhythmite (transgression). The middle member is an organic-rich pelite that is locally pyrite-rich (condensed section and highstand). The two fine-grained members are regionally correlatable, and interpreted to have deposited during a major post-glacial, eustatic rise that terminated coarse-grained siliciclastic input into the basin.

The upper member is highly variable in lithology and thickness (absent to ~200 m), which appears to be controlled by paleogeographic location and sea floor topography on the slope. Slope facies are laterally discontinuous, diverse and include: mudstone–siltstone, diamictites, heterolithic conglomerate-breccia, calcareous quartz-rich sandstone-conglomerate-breccia, calcareous mudstone, and dark-grey arenaceous limestones. In contrast, basinal facies are sheet-like quartz-rich sandstones consisting of interbedded T_{ad} and T_{bcd} sandstone turbidites. The quartzose framework composition of the sandstones are distinct from typical background lowstand turbidites rich in feldspar and reflect winnowing and maturation from residence on the shelf during the earlier transgression and highstand. The base of the upper member is sharp and usually

associated with signficant erosion, locally removing part or all of the lower two members. Deposition of the upper member is interpreted to have coincided with a fall of a relative sea-level caused by post-glacial rebound. Related submarine canyon incision and/or growth faulting controlled sediment transport fairways (lowstand) followed by a renewed relative sea-level rise (transgression and highstand).