

Sedimentology of the Lower Clastic Unit of the Early Cambrian, Northwestern Victoria Island

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Early Paleozoic rocks are widely distributed on Victoria Island but have only been mapped at a regional scale. This study focuses on the basal clastic unit of the Early Cambrian exposed near the head of Minto Inlet. Well exposed outcrop faces in a river cut are conducive to the study of these strata in three dimensions via a series of photomosaics.

The studied section consists of 80 m of siliciclastic strata that lie unconformably over a Franklin gabbro sill that has intruded the Neoproterozoic Minto Inlet Formation. The stratigraphy of the lower clastic unit consists of alternating packages of bioturbated and cross-bedded shallow-marine sandstones, with some shale and siltstone sporadically interbedded in fining-upward successions.

Typical facies in the lower clastic unit include coarse-grained, moderately sorted sandstone with large-scale cross-lamination (Figure 1); medium-grained, well-sorted sandstone with plane-lamination and cross-lamination; weakly to strongly bioturbated, fine- to medium-grained sandstone with intermittent, fine parallel-laminated shale beds; and strongly bioturbated, fine- to medium-grained, recessive sandstone with nodular-weathering and local plane lamination.

Most preserved trace fossils are vertical burrows, in which *Skolithos* is prominent and *Diplocraterion* is occasionally recognized (Figure 2). Arthropod resting traces belonging to *Rusophycus* occur rarely. Olenellid trilobites are present in the greenish shale bed at the top. This shale is about 70 cm thick and is sharply overlain by dolomite.

The lower clastic unit is interpreted to represent the Early Cambrian transgression. Shale deposition at the top is likely due to a flooding event. Alternation of bioturbated and cross-laminated sandstones along with reactivation surfaces suggests a tidally influenced shoreline environment.

The Cambrian stratigraphy of Victoria Island is similar to that of the Northern Interior Plains, which is divided into three main units: the Mount Clark, Mount Cap, and Saline River formations. The lower clastic unit on Victoria Island correlates with the Mount Clark Formation, as both rest unconformably over

Neoproterozoic rocks and share a similar lithology and Early Cambrian faunal content. The dolomite unit overlying the basal clastic unit correlates with the Mount Cap Formation.

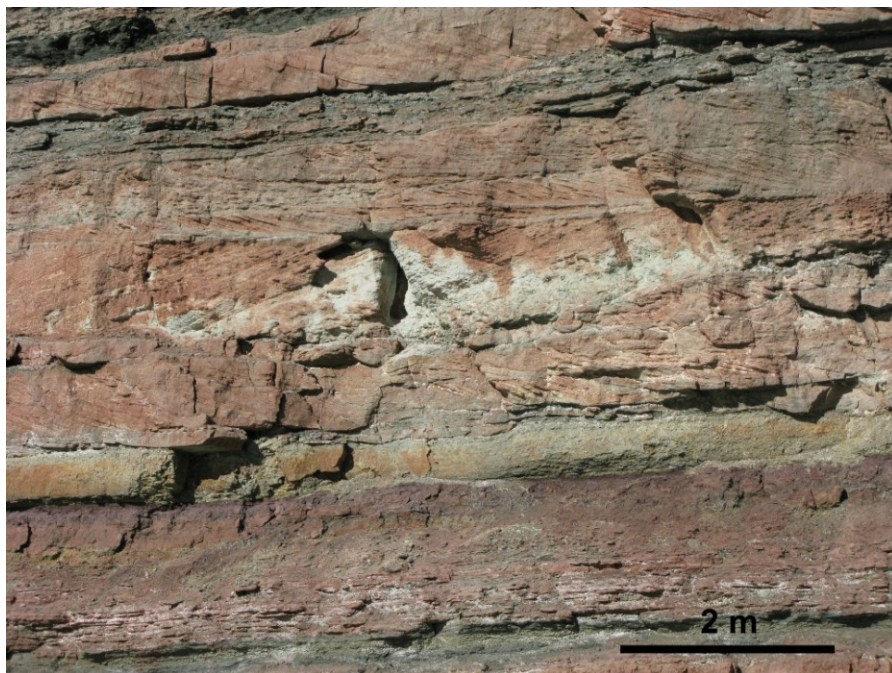


Figure 1: Planar cross-laminated sandstones overlying recessive bioturbated sandstones.



Figure 2: Weakly bioturbated sandstone with parallel lamination and *Diplocraterion* ichnofossil at upper left.