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The Early Cenozoic Tectonostratigraphic Evolution and Sedimentology of the Judge Daly Basin, northeastern Ellesmere Island, Canadian High Arctic

The early Cenozoic evolution of the Canadian High Arctic was governed by a compressional stress regime related to the opening of Baffin Bay-Labrador Sea. On northeastern Ellesmere Island, the Eureka Sound Group sediments (late Paleocene in age) record the paleogeographic reorganisation of this event. This group is divisible into three formations and are preserved within six outliers in this area. The oldest of these units, the Mokka Fiord Formation is characterised by a brown weathering medium - to coarse grained lithic sandstone occurring as decimeter scale trough cross bedded units. These sediments are to 740 metres thick and are interpreted to be a predominantly fluvial deposit. The overlying and younger Cape Back Formation is interpreted to be fluvio-lacustrine in origin consisting of interbedded fine grained litho- to calcarenite, siltstone, and mudrock. Current ripples, climbing ripples, ripple and parallel laminations are common throughout this formation which reaches a total thickness of 1100 metres. Polymictic boulder orthoconglomerates of the Cape Lawrence Formation varies in thickness from 700 to 1000 metres. Clast composition consists of a variety of siliciclastics and carbonates. These conglomerate units are interpreted to be proximal gravely rivers which were alluvial fans. These data provide us with a valuable contribution towards advancing our understanding of the dynamics of this syntectonic siliciclastic depositional system.