

The diversity of life in braided river systems during the Late Triassic at Burntcoat Head, Nova Scotia, Canada

LAURA-ANN BROOM, MARTIN GIBLING, AND TIM FEDAK

Department of Earth Sciences, Dalhousie University, Halifax, Nova Scotia B3H 4R2, Canada

<laura.broom@dal.ca>

Braided-fluvial deposits of the Late Triassic Wolfville Formation at Burntcoat Head have yielded important vertebrate bone material. The present study integrates fluvial sedimentology with the fossil record to gain a more complete understanding of the paleoenvironment and paleoecology. The Wolfville Formation was deposited within the extensional Fundy Basin during the break up of Pangaea. The 30 m studied section comprises channel bodies up to 6 m thick stacked to form three channel-belt complexes with planar bases, up to 13.5 m thick. The channel deposits comprise thin lags of mud-clast conglomerates, coarse- to fine-grained sandstones, interpreted as bedload deposits of bars and channel fills, and floodplain deposits that include pedogenically modified clay rich fine sandstones and claystones with carbonate nodules. Architectural elements include laminated sand sheets, lateral and downstream accretion macroforms, and sandy bedforms, with plane-bedded sandstones and large dunes prominent. Paleoflow was near parallel to the cliff line with an average direction of 057°.

Reworked partial skeletons and bone and teeth fragments reveal a substantial diversity of vertebrates. Collections at the Nova Scotia Museum of Natural History yielded over 60 specimens from the area, some specific to the studied interval. Bone fragments of tetrapods range from a few mm to over 20 cm in length and were found as clasts within mud-clast conglomerates and fine- to medium-grained sandstone. Recent discoveries from the site include the partial skeleton of an archosauromorph reptile, *Teraterpeton hrynewichorum*, and procolophonid reptiles including *Acadiella psalidodon*, *Haligonia bolodon*, and *Scoloparia glyphanodon*. Trace fossils transitional between *Taenidium* and *Planolites* are locally abundant within channel sandstones and floodplain fine sandstones and claystones. Plant fossils were not observed, but possible vegetation-induced sedimentary structures were documented.

The fluvial deposits formed near the paleoequator in a semi-arid climate with seasonal rainfall and high discharge, as indicated by thick plane-bedded sandstones, the abundance of scoured surfaces, and carbonate paleosols. Known localities of bone material are linked to the base of channel fills and in-channel dunes, and the matrix of other fragments suggests a similar setting. Burrows indicate that invertebrates were active in channels during periods of abandonment and in floodplain deposits, and a cryptic record suggests the presence of vegetation. The variety of taxa indicates that life flourished along these Triassic braided channels.