

# **Sedimentology and Sequence Stratigraphy of the Late Carboniferous Sydney Mines Formation at Morien Bay, Sydney Basin, Nova Scotia**

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Extensive coastal outcrops of the Sydney Mines Formation (Westphalian D) at Morien Bay record stacked high-frequency sequences, 10–30 m thick, of fluvial, restricted marine, and possible lacustrine strata, with economic coals. Multiple outcrop sections at Schooner Pond, Long Beach and Port Morien measured 70–150 m in thickness and included the Emery to Harbour seam interval. The dominant facies association comprises grey sandstones and shales and associated hydromorphic paleosols. The coals are sulphur-rich, indicating a marine influence during their development, and range from 0.5–2 m in thickness. The second major facies association includes calcareous paleosols, vertic red and grey paleosols, and red mudstones.

Repetition of wetland and dryland facies, representing regressive and transgressive cycles, is observed in all sections. Marine flooding surfaces are represented by thick coals and faunal concentrate limestone/shale. Sequence boundaries can be identified by the presence of calcretes and red mudstones. The grey, wetland facies are well represented within the Transgressive and Highstand Systems Tracts. Red and grey dryland facies are represented in the topmost Highstand to Lowstand Systems Tracts. The Falling Stage Systems Tract may also be represented here in some valley fills within highstand deposits. Forested horizons of calamitacean and lepidodendrid trees standing in their growth position are observed at many levels within the Transgressive and Highstand Systems Tracts along with abundant compression flora. Rarer litter is identified in red beds of the Highstand through Lowstand Systems Tracts.