

Stratigraphic correlation of a Late Carboniferous interval in the Stellarton Basin, Nova Scotia, and possible evidence for tidal influence

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The Stellarton Basin is located in central Nova Scotia between the Cobequid and Antigonish Highlands. The 6 km by 18 km basin developed as a rhomb graben caused by dextral movement along its two bounding faults, the Cobequid Fault to the north and the Hollow Fault to the south. Deposition began during the Westphalian B and continued until late in the Westphalian.

The Stellarton Formation is composed of approximately 2600 m of Late Carboniferous fluvial, deltaic, and lacustrine strata. This study concentrates on an interval within the Coal Brook Member of the Stellarton Formation. The interval consists of between 10 and 20 m of strata organized into coarsening upward sequences mapped from drill core and outcrop. A typical sequence begins with a flooding oilshale unit that grades into mudrock (some of which is rhythmically

layered), and fine-grained sandstone, the latter units representing regression and delta growth. Coarsening upward sequences grade laterally into predominantly mudrock sequences, indicating increasing distance from the sediment source.

Research carried out as part of this study has found possible paired mud drapes within some of the rhythmically layered mudrock of the Coal Brook Member. This evidence is the first to suggest tidal influence during deposition of the Stellarton Formation, as these structures are characteristic of tidal influence in some modern settings. The possibility of tidal influence is surprising because of the lack of marine fossils and the low-sulfur content of the coals in the Stellarton Basin. If tidal influence is confirmed it would indicate a possible periodic estuarine presence in the system.