

PALEOENVIRONMENTAL SYNTHESIS OF THE DESCHAMBAULT LIMESTONE (LOWER TRENTON) OF SOUTHEASTERN QUEBEC: A STORM DOMINATED RAMP
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The Deschambault limestone of Southeastern Quebec records the facies evolution of the storm dominated carbonate ramp of Early Trentonian Eastern North America.

Four lithofacies are defined 1.) Shallow subtidal mobile skeletal sands - Comprised of coarse biointrasparite and biosparite grainstones with abundant graded beds, intraclast horizons, preserved megaripple trains and horizontal, tabular and trough cross-laminations. Skeletal grains are broken and abraded. Conspicuously lacking are whole fossils, fine muds and a bioturbating infauna. Sediment was deposited as a highly

mobile accumulation of skeletal debris near fair weather wave base. 2.) Shallow subtidal stabilized sands - This lithofacies is comprised of fine biosparite and muddy biosparite grainstones and lesser packstones characterized by comminuted skeletal grains micritized rinds and some lime mud. Infaunal reworking is ubiquitous and primary laminations are rare. Localized hardgrounds, chert nodules and slumpfold horizons indicate early diagenetic alteration of sediments. This facies was deposited in lower energy subtidal depositional environments fringing mobile sands. Storms introduced sediments that were later reworked during long periods of stasis. 3.) Bryozoan bafflestones - This facies is characterized by interlaminated biosparmicrite packstones and bryozoan dominated calcareous shales. Beds are laterally continuous and are arranged in repetitive decimeter scale cycles. Packstones contain whole fossils, are extensively bioturbated and locally contain current features. Shales are matted with articulated arborescent bryozoans in life positions; now crushed by compaction. The sediments accumulated as the result of the baffling and substrate stabilizing capabilities of bryozoan communities. Storms introduced skeletal debris which was then populated by well-developed infaunal and epifaunal communities. This lithofacies was deposited in slightly deeper subtidal environments. 4. Deeper subtidal - This facies is characterized by interlaminated nodular biomicrite wackestones and non-fissile calcareous shales. Pinch and swell bedding, extensive bioturbation and occasional lenses of coarser grainstone and packstone "starved ripples" are typical. Nodularity is controlled by an interplay of original layering, infaunal reworking, early marine cementation and differential compaction. This lithofacies was developed in deeper water subtidal environments where ambient mud deposition was interrupted by upper-ramp sediment influx during storms.

The four recognized lithofacies suggest deposition on a shallow water, normal marine carbonate ramp characterized by high biologic productivity and rapid sediment generation. Facies distributions were primarily influenced by episodic high energy storm events overprinting long periods of normal weather sediment reworking. Syn-depositional fault block motion may also have been of consequence as a facies control.