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**Ichnology of an Ancient, Shallow Marine Embayment: Using Bioturbation Patterns to Enhance Palaeoenvironmental Reconstruction**

The Albian-aged upper Ben Nevis Formation in the Hibernia Field of the Jeanne d'Arc Basin is an ichnologically complex interval. It consists of highly bioturbated, silty sandstone initially interpreted as lower shoreface deposits. Upon closer examination of the biological component, trace fossil assemblages representing an ecologically stressed community of organisms were identified. These unique assemblages developed in response to changes in environmental or ecological conditions. Variations in such parameters are common in "stressed" marine systems such as shallow embayments or sounds.

A "stressed" marine system is characterized by fluctuations in environmental/ecological conditions (such as salinity, oxygenation or sediment influx) outside of the "normal" range of marine parameters. For example, "stressed" marine conditions exist in Norton Sound, Alaska due to fluvial output of the Yukon River. In comparison, modern deposits from Norton Sound are characteristically similar to those of the upper Ben Nevis. Trace fossil assemblages found in both deposits are characterized by overlapping marine and brackish ichnological signatures. The resulting biogenic fabrics exhibit moderately diverse trace fossil assemblages, nearly complete bioturbation, and domination by one or two ichnogenera.

Recognition of "stressed" trace fossil assemblages in the upper Ben Nevis Formation is extremely important in palaeoenvironmental and palaeotectonic analysis. Prior to this study, deposition in the Hibernia area during Albian time was thought to have taken place in relatively open marine and tectonically stable conditions. As a result of this study, it is now believed that deposition took place under restricted, shallow marine conditions created by syn-depositional faulting, subsidence, and rollover.