Trace fossils are useful - an example from the Caribbean

R. K. Pickerill[1], S. K. Donovan[2], and R. W. Portell[3]
[1]*Department of Geology, University of New Brunswick, Fredericton, NB E3B 5A3*
[2]*Department of Palaeontology, The Natural History Museum, Cromwell Road, London SW7 5BD, U.K*
[3]*Florida Museum of Natural History, University of Florida, Gainesville, FL 32611-7800, U.S.A.*

The eastern side of the small island of Carriacou in the Grenadine chain of the Windward Islands, Lesser Antilles, exposes mid-Tertiary siliciclastic and carbonate strata that have been previously subdivided into four formations, namely the Lower Miocene Belmont Formation, the Lower-Middle Miocene Kendeace Formation, the Middle Miocene Carriacou Formation and the Middle Miocene Grand Bay Formation. The Grand Bay Formation, the subject of this contribution, is the most widely (and excellently) exposed sequence, and essentially consists of a sequence of volcaniclastic sandstone with associated interlayered calcareous mudstone and minor conglomeratic horizons.

The most recently published palaeoenvironmental interpretation of this sequence has considered it to be of shallow-water origin. The strata are abundantly fossiliferous, many horizons possessing diverse assemblages of scleractinian corals, isocrinids, terebratulid brachiopods, and, particularly, molluscs. Although uncommon, several of these groups contain borings that include *Caulostrepsis cretacea*, *Caulostrepsis* n. isp., *C.* cf. *taeniola*, *Gastrochaenolites cluniformis*, *G. difugis*, *G. torpedo*, *Oichnus paraboloides*, *O. simplex*, *Petroxestes pera*, *Rogerella* isp., and *Trypanites solitarius*. Soft-sediment ichnotaxa are also present, albeit sporadically. The detailed systematics of these are still under study but the following ichnogenera are prevalent: *Chondrites*, *Diplocraterion*, *Gordia*, *Planolites*, *Scolicia*, *Skolithos*, *Teichichnus*, *Thalassinoides*, and *Zoophycos*.

Collectively, this latter ichnofaunal assemblage compares well with others described from deep-water sequences, particularly those from Cretaceous deep-sea chalks of northern Europe. We suggest, therefore, that the Grand Bay Formation is similarly a deep- and not shallow-water sequence. Our conclusions are supported by both sedimentological and faunal evidence.