

A continent-scale delta's effect on the north end of a Jurassic–Cretaceous gigaplatform: the Abenaki carbonate-Sable delta study a decade or so later, offshore Nova Scotia, Canada

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My study was to describe and understand the strange relationship of a thick extensive carbonate platform coexisting for a long time (15 Ma) beside a continent-scale delta. After finding no analogues in the modern world oceans but some interesting examples of reefs in or near deltas, an explanation was proposed to address two questions with the results not wholly convincing for the first and more satisfactory for the second. (1) morphology, nature and origin of a big delta/thick carbonate platform juxtaposition and lateral ramp carbonates. A bathymetric 'gap' best explains the systems' juxtaposition with their very different styles of carbonates. This interpretation is supported by vintage seismic data and the nature of the transition shown in well sections and cores. More work can be done using newer and better seismic data sets, and by considering with modelling the effect of deltaic sediment loads on creating a lateral moat and potential compensatory distal highs. Another possible control in the modern is favourable ocean currents but not easily proved in the ancient record. (2) Possible lateral effects on platform margin carbonates due to proximity of deltaic sedimentation depends on location and can be nearly non-existent within the platform, subtle on the slope and profound, long continued and variable on the top during the expansion of the delta. This explanation is supported by the presence of rare, thin quartz sandstone beds or oolite nuclei on the main platform, the increasing influence of slope onlap prodelta shales, and some lateral changes in slope carbonates. There are also wholesale reef mound community changes at top of the Abenaki succession, but without presence of coarse terrigenous clastics. Further features such as common reworked microfossils, Neptunian dykes, and condensed marine redbeds indicate that the distal sedimentary section may be more gap than record with both submarine and subaerial hiatuses even including suspect mixing zone dolomite. There seems to be a consistent diachronous relationship to prodeltaic siliciclastic, sponge-rich, and marine redbed successions.

The world's longest modern coral reef tract, Australia's Great Barrier Reef, ends in the Fly River Delta of the Gulf of Guinea (Tcherepanov et al. 2008, 2010). The world's largest river, Brazil's Amazon, has a long, narrow but cryptic reef tract on the edge of its wide continental shelf (Moura et al. 2016). While not platforms, these modern examples give insight into the deltaic termination of the Phanerozoic's longest carbonate platform.