Varied carbonate facies from the Jurassic–Cretaceous gigaplatform margin of the Baltimore Canyon Trough, offshore New Jersey, USA

LESLIE S. ELIUK[1] AND BRADFORD E. PRATHER[2]

1. GeoTours Consulting Inc., Box 852, Lunenburg, Nova Scotia B0J 2C0, Canada
2. CarTerra LLC, 715 Knox Street, Houston, Texas 77007, USA

In 1984, three wells operated by Shell tested various types of Jurassic–Cretaceous carbonate shelf and margin plays in deep water offshore New Jersey. Eleven cores were recovered: OCS-A 0336 cores R1-4, OCS-A 0337 cores C1-3, and OCS-A 0317 cores H1-4. Representative core intervals on display are keyed to seismic morphology, and show litho-biofacies from three geometrically and stratigraphically separate shelf edges: (1) Oxfordian– Kimmeridgian prograded margin (R1+2) and slope (C3); (2) Late Kimmeridgian–Berriasian aggraded margin capped by pinnacle reefs (C2, H3+4) followed by an extensive deeper-water mounded sponge-rich interval of Berriasian and Valanginian age (R2, C1, H2); and (3) a back-stepped Barremian–Aptian reef margin (R1) on prodeltaic shales.

Alternatively, cores can be facies-grouped into deeper-water upper slope microbial(?) mound (C3) and reef complex (R3–foreslope? + R4-reef framework and sands) of the prograded margin, shelf-edge shallow-water skeletal sands (H3+4, C2) in the aggraded margin, and deep-water carbonates capping a drowned shallow-water shelf (R2, C1, H2) then middle Cretaceous shallow-water shelf-edge oolite (R1).

Previously unpublished paleoenvironmental models by Edwin Ringer and Harvey Patten illustrate the depositional facies relationships. No analogue is perfect, but older (and with the 1999 Panuke gas discovery many more recent) Nova Scotia (NS) shelf-edge wells also sample the Jurassic–Cretaceous gigaplatform margin. Though similar enough to apply the same formational terminology, and a very similar vertical depositional progression including 'drowning', the Baltimore Canyon wells in general sample much more carbonate-sand-rich beds. Whereas the NS margin wells sample muddier but much more reef framebuilder-rich beds. The basins have some major difference but these biofacies differences may indicate a "sampling" bias; possibly shallow-water J–K reefs simply grew in slightly deeper water. The best depositional model will integrate both data sets. Degree of dolomitization remains a significant difference.

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