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## **Distinguishing Autocyclic Events from Allostratigraphic Discontinuities: A Case Study from the Oficina Formation of Eastern Venezuela**

A key issue in high-resolution sequence stratigraphy is the distinction of normal facies successions from regional lowstand surfaces of incision. This is especially problematic in areas of sparse core control, where sharp-based sandstone units are commonly regarded as allostratigraphic surfaces and mapped as sequence boundaries. Even a single cored well, however, can provide valuable insight when detailed sedimentologic and ichnologic criteria are used in combination with careful well log correlations. A 99-foot section of core from a newly drilled well was used to calibrate a previously defined sequence-stratigraphic model in the Early to Middle Miocene Oficina Formation. The interval is part of an important coring program that was undertaken in the mature Santa Rosa Field of the Eastern Venezuelan Basin.

The previous sequence model shows an incision surface through a section where new detailed sedimentologic and ichnologic studies reveal no evidence of facies dislocation. In the new core, trace fossil assemblages indicate a change from fully-marine and storm-dominated shelf conditions, to a stressed environment with rare bioturbation followed by open marine conditions. The presence of thin sandstone units with sharp tops and bases, overlain by a coarsening-upward sandstone unit with sparse hummocky cross-stratification, suggest the progradation of a wave-modified deltaic system over the storm-dominated shelf. Correlation and mapping of these deltaic units reveals three separate events of deltaic lobe progradation and abandonment. This case study demonstrates that it is quite likely to misinterpret autocyclic lobe-switching with allostratigraphic surfaces of incision when lacking adequate sedimentological and ichnological control.