

Evidence for Hierarchy of Stratigraphic Forcing in the Upper Carboniferous (Virgilian, Wabaunsee Group) in the Anadarko Basin

Matthew W. Boyd and Darwin R. Boardman, II
Oklahoma State University, Stillwater, Oklahoma

Analysis of Upper Carboniferous (Virgilian, Wabaunsee Group) strata cropping out in the North American Midcontinent suggests a hierarchy of stratigraphic forcing. Fourth-order depositional sequences from the Wabaunsee Group represent the latest highstand sequence sets of a composite third-order sequence (1–10 m.y.) that encompasses strata from the Douglas, Shawnee, Wabaunsee, and Admire Groups.

The composite third-order sequence (110 m.y.) is composed of 15 composite fourth-order depositional sequences (0.1–1 m.y.). The composite fourth-order depositional sequences of the Wabaunsee Group contain between two and three fifth-order cycles (0.01–0.1 m.y.). These fifth-order cycles form retrogradational transgressive system tracks and aggradational to progradational highstand-system tracks.

Lowstand units are composed of incised valley-fill deposits or laterally extensive paleosols. The fifth-order cycles are separated by poorly developed, laterally discontinuous paleosols or marginal-marine units. These poorly developed paleosols are expressed as coals, coaly shales, or underclays.