

Stratigraphic Sequences of the Wilson-cycle rifting stage : A General Model

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Plate tectonic models explain the close relationships among basin geometry, sedimentary rock type, and tectonic setting. Secular changes in sedimentary fill of "Wilson-cycle" orogens like the Appalachian-Caledonian reflect tectonic constraints imposed as ocean basins open, spread, and close.

The initial stage during which continental crust is fragmented into separating continental blocks is especially interesting sedimentologically. Based on Late Precambrian sequences of eastern N.Am, a variety of basins can be defined: (i) Triassic-like intracratonic basins; (ii) aulacogens embayed into the continental interior; and (iii) debris aprons flanking scarps along zigzagging continental edges. Signatures of sequences include enormous thickness, high rates of sedimentation, centripetal and radial dispersal, and a diagnostic sandstone framework mineralogy.

Late Precambrian sequences of the circum-Atlantic region provide a guide by which contemporaneous rocks of western North America (possibly related to the rifting away of ancestral South America) can be better understood. They also serve as a model for the rift stage of Wilson cycle belts in general.