

Sequence Stratigraphy of the Permian-Triassic Boundary in the Sverdrup Basin, Canadian Arctic

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Abstract

The Permian-Triassic transition is usually associated with a major subaerial unconformity and part of the stratigraphic record is usually missing. The unique intra-cratonic setting of the Sverdrup Basin offers a different perspective where the Upper Permian to Lower Triassic transition is characterized by: (1) a Late Permian RST of deep-water siliceous shale and chert (van Hauen) passing upward into shallow-shelf chert (Lindström); (2) a Late Permian TST of black chert passing upward into siliceous shale (uppermost van Hauen); and (3) a latest Permian-Early Triassic RST of deep-water non-siliceous shale passing upward into progressively siltier and sandier clastic deposits of increasingly shallow water origin (Blind Fiord).

At the basin margin a sharp erosional surface separates the lower RST from the overlying TST and thus constitutes an unconformable sequence boundary. Basinward, the succession is conformable and the sequence boundary is picked at the point of maximum regression. The contact between the Late Permian TST and overlying latest Permian-Early Triassic RST is conformable in the basin centre and characterized by the deepest-water facies development. The upper RST lies unconformably on top of the lower RST at the basin margin and directly upon Middle Permian carbonates (Degerböls) inland.

The basal boundary of the Blind Fiord Formation (traditional P-T boundary) is thus both a major unconformity at the proximal basin-margin and a conformable maximum flooding surface in the distal basin-axial area. The P-T boundary, as suggested by the first appearance of the conodont *Hindeodus parvus*, lies more than 30 m above.