

Origin of the Northeast Alaskan Orocline

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Abstract

The northeast Alaskan orocline is a latest Cretaceous-Early Tertiary feature formed by a complex interplay of far-field tectonic drivers and local boundary conditions. In the 1980's the indentor tectonics model became popular in the interpretation of convergent zones bounded by fault systems with apparently conjugate geometry. As applied to the latest Cretaceous-Tertiary northeast Alaskan orocline (Collot et al., 1984), this model failed to account for much of the north Yukon Fold Complex, although a regional kinematic setting dominated by east-west convergence was supported (e.g., Lane, 1998). The northeast Alaskan orocline refers to the continuous curvature of structural trends from east-west in the Brooks Range, through the arcuate Beaufort Foldbelt into the north-south trend of the North Yukon Fold Complex. Most of the deformation in the region of the orocline occurred in the ~70-45 Ma time interval, although the age of onset is approximate (e.g., Lane and Dietrich, 1995; Lane, 2004). Although more than 1000 km from plate boundaries, two sets of tectonic interactions are responsible. First, northward emplacement of Alaskan terranes on strike-slip faults within the Cordillera and subduction of Pacific-side plates were responsible for widespread north-directed displacements in Alaska and Canada. Second, east-west convergence likely related to latest Cretaceous - Early Tertiary opening of the North Atlantic Ocean has been identified as the probable driver of east-west shortening that was more localized in the area of the orocline (Lane, 1998, and references therein).

References Cited

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