

Evidence for Early Eastward Translation of Shortening in the Sevier Thrust Belt, Northeast Utah and Southwest Wyoming, U.S.A

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Cross-section restorations across the Sevier thrust belt in northeast Utah and southwest Wyoming show bed length discrepancies within the hanging wall of the Absaroka thrust, and suggest that shortening above the Jurassic Preuss salt detachment was 8-14 km greater than shortening below the salt detachment. Interpretation of newly-reprocessed, two-dimensional seismic reflection profiles over the hanging wall of the Crawford thrust, an older fault to the west of the Absaroka thrust, shows that the Crawford thrust is not offset across the Preuss salt detachment. This indicates that the additional shortening within the hanging wall of the Absaroka thrust sheet was transferred east before main movement on the Crawford thrust. Although early displacement on the Crawford thrust could be responsible for the extra shortening, surface and subsurface geology suggests shortening from the western thrust system (Willard and Lost Creek thrusts) was transferred several tens of kilometers east along the Jurassic Preuss salt detachment between ~102 and 90 Ma, coeval with deposition of the Cenomanian-Turonian Frontier Formation, to the future location of the Absaroka thrust hanging wall. The continuity of the Crawford thrust across the Preuss salt detachment also suggests that the magnitude of Paleocene and post-early Eocene shortening on the Medicine Butte thrust was essentially offset by subsequent extension on the middle Eocene to late Oligocene Acocks-Almy normal-fault system.