

Public Abstract

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Title:LARAMIDE STRESS CONDITIONS AND DEFORMATION MECHANISMS DURING THE FORMATION OF HUDSON AND DALLAS DOMES, LANDER QUADRANGLE, WIND RIVER MOUNTAINS, LANDER, WY

Laramide fold forms along the northeastern flank of the Wind River Range in west central Wyoming include Dallas Dome, an asymmetric pericline verging toward the core of the range. The fold's pattern and geometry are derived from regional scale tectonic stresses that have been complicated by local stress conditions associated with buckle folding and potential basement involved faulting (forced folding). The purpose of this study was to determine the fold-inducing mechanisms forming Dallas Dome via geologic mapping surface deformation, collecting and analyzing fault and fracture orientation data, and interpreting the results to deduce the fold's deformation geometry, folding mechanisms and associated stresses. Mapping and well log constraints indicate that the geometry of the fold form is a result of local basement involved faulting, propagating upward into a dual thrust system in the overlying sedimentary units. The offset on the dual thrust system diminishes northward, where forelimb strata become decreasingly tilted and basement offset diminishes.

Regional fracture sets R1 (45/225) and R2 (75/255) were determined to be directly associated with maximum principal shortening directions during Laramide and Sevier Orogenies, respectively. Fold induced fracture sets include J1 (60/240), J2 (160/340), J3 (105/285), and J4 (55/235; 65/245), and are associated with both buckle and forced folding.