

New Structural Interpretation of the Central Confusion Range, Western Utah, Based On Balanced Cross Sections

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The Confusion Range is a topographically low mountain range in the Basin and Range of west-central Utah, located east of and in the hanging wall of the Snake Range core complex. Previous workers have used a gravity sliding model to interpret the Confusion Range as a large structural trough or synclinorium (e.g. Hose, 1977). Based on existing mapping (Hose, 1965; Hintze, 1974) and new field data, we use balanced and restored cross sections to reinterpret the structure of the Confusion Range as an east-vergent fold-and-thrust belt formed during the Sevier Orogeny.

The Confusion Range consists of Cambro-Ordovician through Triassic strata, with predominantly thick-bedded, competent carbonate rocks in the lower Paleozoic (lPz) section and incompetent shales and thin-bedded carbonates in the upper Paleozoic (uPz) section. The contrasting mechanical behavior of these stratigraphic sections results in faulted folds within uPz carbonates above detachments in shale-rich units, deforming in response to ramp-flat thrust faulting of the underlying lPz units.

East of the axis of the Conger Mountain (Mtn) syncline, we attribute the increase in structural elevation of lPz rocks to a subsurface thrust sheet consisting of lPz strata that advanced eastward via a high-angle ramp from a lower detachment in the Kanosh Shale to an upper detachment in the Pilot Shale. The doubling of lPz strata that resulted continues through the eastern Confusion Range where a series of small-displacement thrust faults comprising the Kings Canyon thrust system gently tilt strata to the west.

In the Conger Range, west of the Conger Mtn syncline, our analysis focuses on reinterpreting the geometrically unlikely folding depicted in previous cross sections as more admissible, fault-cored, asymmetric, detached folding. In our interpretation, resistance created by a steeply-dipping thrust ramp in the lPz section west of Conger Mtn resulted in folding of uPz strata into an east-vergent anticline. Continued east-vergent contraction against the ramp resulted in the west-dipping limb of the anticline, consisting of Ely Limestone, developing into an overturned, west-vergent, synclinal backfold detached in the Chainman Shale. Further contraction exceeded the fold capacity of the detachment fold and resulted in the formation of the Browns Wash fault as an east-vergent thrust fault. The Browns Wash fault is a key component in the development of the present structural geometry, emplacing a west-vergent overturned syncline (detachment fold) in the hanging wall against an east-vergent overturned syncline (footwall syncline) in the footwall.

Further west, underlying the western Conger Range and Buckskin Hills, lPz strata are exposed in what we interpret to be a ramp anticline overlying a subsurface thrust ramp. This interpretation implies a lateral ramp separating lPz rocks in the Buckskin Hills from uPz rocks exposed in the Knoll Hill anticline to the north. uPz and Mesozoic strata exposed to the west on the edge of Snake Valley were emplaced by a Tertiary west-dipping normal fault that truncated the west limb of the ramp anticline.