ABSTRACT

TITLE:	Kinematic Modeling of the Rampart Range Fault, Colorado Springs, Colorado
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The Rampart Range Fault zone forms the boundary between the Precambrian basement of the Front Range and the Paleozoic and younger sedimentary rocks of the plains near Colorado Springs, Colorado. The fault may have been active as recently as the Holocene, based on offset of late Tertiary and Quaternary fill near the Air Force Academy and magnitude 2.8 to 4.0 earthquakes near Colorado Springs in the 1990s. The fault has a complex geometry where it is exposed in the Garden of the Gods, with numerous splay faults that have opposite dip directions from the master fault. Geometric and kinematic modeling of the Rampart Range fault were conducted using Midland Valley's structural modeling and analysis program Move™. Geometric modeling using flexural slip unfolding did balance the cross-section with minor imperfections. Kinematic forward modeling using trishear reproduced a similar overall geometry to the cross-section. Although splay faults were not generated by the trishear modeling, they can be explained as accommodation of the thickening of mechanically strong units (such as the Dakota Sandstone, the Lyons Formation, and the Fountain Formation) in the hinge of the trishear zone.

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