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What Is A Fold-Thrust Belt? And How Do We Explore It?

The conventional fold-thrust belt (FTB) structural style was a construct of convenience which allowed a set of simple interpretation "rules" - formulated during the 1950s through 1970s - to be effectively applied in exploration. These rules emerged from pioneering work conducted in the Canadian Rockies and Appalachians, foreland fold belts typified by a mechanically rigid miogeoclinal stratigraphic architecture, a rigid but uninvolved structural floor (basement), and largely predictable modes of flexural slip deformation. Simplistic rules were and often still are useful since most explorationists are not trained as structural specialists.

More recent exploration in deep water and previously remote regions, and major improvements in seismic imaging, have forced the realization that conventional foreland FTBs are not the paradigm for all FTBs, but only part of a spectrum of possible compressional deformation styles. "Non-conventional" FTBs may diverge from the conventional style model in such matters as: (1) common out-of-sequence thrusting; (2) a foreland-sloping basal detachment; (3) detachment "zones" several kilometers in thickness rather than discrete stratigraphic decollement; (4) deformation by diffuse shear as opposed to flexural slip; (5) simple shear deformation of the sedimentary section; and many other aspects.

Exploration in non-conventional FTBs requires both more sophisticated applications of traditional rules, and the creativity to realize when those rules must be broken. Additionally, such diverse techniques as traditional surface mapping and research into alternative deformational mechanisms provide important contributions to our understanding of non-conventional FTBs. As illustrations, we provide exploration overviews of selected non-conventional FTBs in Asia, Africa, and the Americas.