Testing Predictions of Structural Model Against Uplift Rates in the Western Transverse Ranges, Southern California

Yuval Levy[1]
[1]San Diego State University and University of California, San Diego, Structural Geology, San Diego, CA USA
uvlevy@gmail.com

ABSTRACT

Understanding the structure and evolution of Fold-and-thrust belts is key for successful exploration of petroleum in many regions. The Western Transverse Ranges is an active fold and thrust belt and contain one of the thickest sedimentary basins in the world. This region has been studied extensively due to its location and presence of fossil fuel reservoirs. A number of structural models for this region have been proposed over the years, however, to date no structural model explains the full range of observations, especially not the geological and geodetic uplift rate. We suggest a structural model that was produced by Trishear forward modeling, and later was tested and improved by comparing the predicted uplift rates against GPS signal and uplift rates as observed from terraces. In our work, we present additional uplift rates in the region, from fluvial terraces north of the Santa Ynez Mountain Range. We present for the first time a model that explains the full range of geological and geophysical observations. The process we present can be applied to other regions and help as an additional constraint in building structural model, and help with resolving the geometry of faults at depth.

AAPG Search and Discovery Article #90321 © 2018 AAPG Foundation 2018 Grants-in-Aid Projects