

Tectonic Controls on the Remigration of Hydrocarbons: Looking Beyond Nevada's Commercial Oil Seep Play

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Remigrated hydrocarbons trapped below a blanket of Tertiary volcanic rocks strongly suggest that huge fault folds in the Nevada portion of the Sevier thrust belt contain significant volumes of oil and gas. About a quarter of the earth's known reserves of oil and gas are found in thrust belts. Surface oil seeps commonly occur in thrust belts charged with oil and gas such as the Wyoming-Utah portion of the Late Cretaceous Sevier thrust belt. However, oil seeps in the Nevada portion of the thrust belt have been trapped by a blanket of Tertiary volcanic rocks. After trapping the remigrated oil for thirty or forty million years some buried Nevada oil seeps became commercial. All the commercially produced oil in Nevada, nearly fifty million barrels, has been produced from these commercial oil seeps. One of these commercial oil seeps is the Grant Canyon field that has produced twenty million barrels from essentially two wells since its discovery in the early 1980's. However, exploration beyond the buried oil seeps has been limited because of trust placed on published misinterpreted tectonic models based on inaccurate geologic maps.

Nevada does not have a geological survey. cursory geologic maps of Nevada counties prepared by the United States Geological Survey have been found to be inadequate for oil and gas exploration. As a result, the huge potential of the Nevada portion of the Sevier thrust belt has not yet been realized. The north-south structural grain of the eastern Great Basin was caused by the east vergent compression during the Sevier orogeny. A blanket of Tertiary volcanic rocks conceals the thrust belt. Recent erosion has exposed the upper portion of some larger thrust duplexes. Nearer the Colorado River where erosion has cut the deepest, exposed 65 million-year-old fault folds show that they have not been compromised by the theoretical subsequent extensional faulting.