Geometrical analysis of a complex fold-fold fabric, Octoillo Wells State Vehicular Recreation Area.

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Aerial photographs and Google Earth images clearly show that the Pliocene-Pleistocene sedimentary infill of the Salton Basin is complexly folded and faulted. However, little detail geometrical analyses of such structures have been completed. Hence, I undertook a detailed study of a complexly folded and faulted area lying east of Poleline Road in the Ocotillo Wells State Vehicular Recreation Area.

Within the specific study area, in ascending order, the following three informal lithostratigraphic units were mapped: mudstone, interstratified mudstone and sandstone, and conglomerate. These units are folded about an EW trending anticline, and are cut by high-angle reverse fault. These two structures define a high strain zone, bounded to the east by a NW striking dextral strike-slip fault zone, and to the west by several NE striking sinistral strike-slip faults, and imply NW shortening and EW extension during the development of the fold-fault fabric.

Lying immediately to the north of the high strain zone is the Poleline Road syncline. A major dextral-reverse oblique-slip fault subdivides the syncline into two eastern and western domains. In the eastern domain the Poleline Road syncline trends EW, and in the western domain NW. In order to constrain the geometry of the Poleline Road syncline within these two domains, six cross-sections were constructed and labeled from east to west, A-A' through F-F'. Along each cross section the geometry of the Poleline Road syncline was evaluated through a detailed stereonet analysis. The first step of this stage of my work was to plot and contour poles to bedding attitudes within each limb of the fold along each cross section. In each case, poles to bedding attitudes clustered in lower hemisphere equal area space, and as a result, an average of the cluster of points was used to define the attitude of each limb of the syncline. The resulting average attitudes of each limb were used to solve for the interlimb angle and the attitudes of hingelines and axial surfaces along each of the six cross sections. This analysis indicated that the Poleline Road syncline varies from tight to open with interlimb angles varying from 60^{o} -116^{o} in the eastern domain. In contrast, in the western domain it is open with interlimb angles varying from 128^{o}-163^{o}. In addition, in both the eastern and western domains the syncline varies from gently plunging and upright to sub-horizontal plunging and upright.

The general geometry of the fold/fault fabric within the study area is consistent with a maximum principal stress direction oriented ~NS while the minimum principal stress direction was oriented ~EW. The dextral-reverse oblique-slip fault that subdivides the Poleline Road syncline into two major domains, likely formed as a result of material being driven westward out of the high strain zone.