

3D Terrain Modeling to Visualize the Morphology of the Fisher Valley Megaflap

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ABSTRACT

Megaflaps are steep panels of strata that extend kilometers up the side of a salt diapir, having been deposited directly on top of a salt body and later rotated. These structures can complicate the petroleum traps found alongside salt diapirs. The Paradox salt basin is an Ancestral Rocky Mountains foreland basin associated with the Uncompahgre Uplift, the primary sediment source of the basin. The Fisher and Gypsum Valley salt walls, both of which have megaflaps, are a product of this salt system. I have evaluated the structural, sedimentologic and stratigraphic attributes of the Fisher Valley megaflap and compared it to the Gypsum Valley megaflap. I have found that while Gypsum Valley has almost no lateral changes in thickness or facies and shows no structural complications, Fisher Valley has lateral changes in thickness and facies and is folded at one end. These differences have implications for drawing broad conclusions about megaflap morphology, and how such morphology affects trap geometry. To further evaluate Fisher Valley's structure, I am going to collect additional imagery with a drone to make a 3D terrain model encompassing all the megaflap's lateral changes and structural complications. Terrain modeling is accomplished by taking video with a drone, selecting images that show a diversity of the area, and then processing those images in Agisoft Photoscan. In the end, I will be able to create a terrain model and high resolution orthorectified image and topographic map of my study area, which will allow me to illustrate the complicated geology of the megaflap.