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Integrated 3-D Salt Dome Modeling in ArcView

We have modeled over four hundred salt domes and other salt features worldwide. We also produce integrated geological and geophysical interpretation and exploration projects in ArcView. We have merged these two processes together. The merging has resulted in not only a more integrated approach to interpretation, but also a much more efficient method of doing the modeling itself.

Modeling begins with a modified Cordell-Henderson inversion for the initial salt body model. The model is then constrained further with available local seismic and well penetrations. The salt body models are represented as contours within an ArcView shape file. The gravity field is calculated from initial and subsequent models using the Talwani-Ewing method by clicking on a "Tool" button and sending the shape file to the external program. This program then calculates the gravity field for the model as a grid and converts the grid into a GeoTiff. The GeoTiffs of the measured gravity field, calculated field and their difference are displayed in this highly integrated ArcView GIS environment along with the salt contour shape files, well and seismic location. The contour shape files are edited in ArcView to better match the measured field. This process continues in an iterative manner until the calculated and measured fields match closely. The intermediate and final results can then be viewed with our interactive 3-D model viewing software that is hot-linked to the salt dome location in ArcView.