

## **Cantarell and Sihil Structures, Campeche Bay, Mexico: 3-D Structural Interpretation and Visualization**

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The Cantarell and Sihil structures, located in the Campeche Bay province, constitute the largest hydrocarbon-producing structural complex in Mexico. The geometry of the Cantarell-Sihil structure varies considerably along trend from a simple fault-related structure, controlled by Jurassic normal faults in the south, to a duplex consisting of the Cantarell and Sihil structures in the central part, to a complex thrust system displaced by Tertiary normal faults in the north. The structures formed during three main episodes of deformation: (1) Jurassic extension, (2) Miocene compression, and (3) late Tertiary extension, involving reactivation of pre-existing Jurassic normal faults.

A three-dimensional model for the Cantarell and Sihil structures has been developed by integrating 3-D seismic interpretation, data from over 300 wells, and a series of structural cross sections. Structural reconstruction has been used to understand the kinematic evolution of the structure. The Cantarell field produces out of three separate fault-bounded allochthonous blocks: the Akal, Nohoch, and Kutz blocks. The main field is located in the Akal structure. Secondary fields include Kutz, formed along the crest of a downthrown extensional block, and Nohoch, formed above a back thrust. The Chac field is located at the updip edge of a tilted fault block in the autochthonous sheet. The recently discovered Sihil field is located within a subthrust compressive structure, and consists of two lobes related to the sub-Sihil fault. The detailed three-dimensional structural model is being used for production of remaining reserves in the Cantarell field as well for delineation of the Sihil field.

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