AAPG International Conference
Barcelona, Spain
September 21-24, 2003

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Egyptian Western Desert Jurassic and Cretaceous Structural Styles

Interpretation of the 3D seismic with calibration to wells and outcrops has resulted in a detailed understanding of the Jurassic and Cretaceous structural evolution of the Western Desert Basins. Apache Egypt has acquired regional datasets and more than 8000 km^2 of high quality 3D seismic data in the Western Desert of Egypt over the past 5 years.

The Jurassic is characterized by normal faults that formed in conjunction with the opening of the Neo-Tethys to the north. Basement grain and lineaments may have played a significant role in structural and stratigraphic development. Jurassic sub-basins in the form of grabens and half grabens control the deposition of Jurassic source and reservoir rocks. Rifting and normal faulting continued into the Early Cretaceous as indicated by growth across normal faults in the Alam El Bueb Formation. By Albian-Aptian time rifting and associated extension ceased in the Western Desert.

The Late Cretaceous and Early Tertiary is a period of renewed tectonic activity in the Western Desert. A period of widespread extension resulting in pervasive, but typically small throw, normal faults initiated in the Santonian-Campanian. This is followed almost immediately by a period of compressive tectonism (Syrian Arc deformation) in which many of the Jurassic and Cretaceous normal faults are reactived as reverse faults. Detailed isopach maps of the Cretaceous demonstrate that the Syrian Arc period of compressive tectonism in the Western Desert is not associated with widespread strike-slip deformation. Compression continues and reaches a peak in the Paleocene to Early Eocene. The Late Tertiary tectonism which is key to the Gulf of Suez and Nile Delta plays has an insignificant effect on the Western Desert structural geometry.