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"Unconformity Analysis"

Abstract

Unconformities, at one time regarded as representing records of simultaneous world-wide events, and thereby forming the "ultimate basis of correlation," are now known to merge laterally along strike and to disappear down dip. A continuous sequence of types occurs, from high angle unconformities to paraconformities. Most significant to the oil geologist are the low angular unconformities, found commonly on the shelf and geosynclinal margin. These characteristically occur in repetition as the basin margin is continually flexing during deposition. Analysis involves interpretation of combined outcrop-subcrop-worm's eye maps to the end of reconstructing geologic history. Given an onlapping sequence of beds, thinning shoreward, one of four possible results may accrue: tilt may take place directly down towards the sea, at an angle to the shoreline, warping into a syncline, or upbending into an anticline. Secondary and subsequent sea advances may or may not conform to the earlier structure. Erosion produces bands of outcrop and facies either parallel to one another and to the unconformity, or outcrops diverging, crossing facies, and intersecting unconformities at an angle. Pattern depends on the type of fold or tilt; angles upon amount.

Southwest Arkansas is presented as an example of an area where repeated straight tilts have produced five major unconformities. Northeast Texas is a region of repeated synclinal downwarp; four major unconformities are shown. The Hunton anticline of central Oklahoma is an area of repeated upwarp; four unconformities are present.

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"Carbonate Sediments and Structures of the Campeche Bank, Yucatan"

Abstract

The Yucatan Shelf (Campeche Bank) is a deep, inclined shelf which projects into the southern Gulf of Mexico from the Peninsula de Yucatan. The shelf is approximately 22,000 square miles in area and extends 70-180 miles from the shoreline to a shelf-slope break in depths of 600 to 900 feet. The Peninsula de Yucatan and much of the seaward shelf are underlain by karsted limestones of Tertiary and Pleistocene age. There are no major rivers due to the karst topography of the hinterland. The effect of the small run-off influx is a lack of terrigenous detritus on the Yucatan Shelf. The late Quaternary sediments are pure carbonate types composed of skeletal and non-skeletal constituents. The skeletal component of shelf sediments is dominated by benthonic mollusca, corals, foraminifera and calcareous algae; non-skeletal grains include pellets, ooids, lithic (limestone) fragments and some aggregate grains. Emergent coral reefs, submerged reef banks and biostromes form a series of prominences above the shelf level around the outer margins.