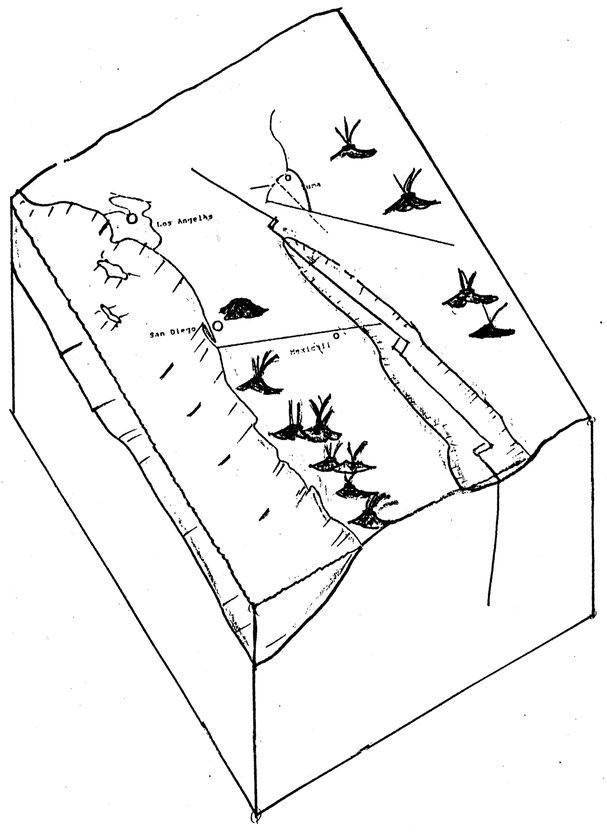
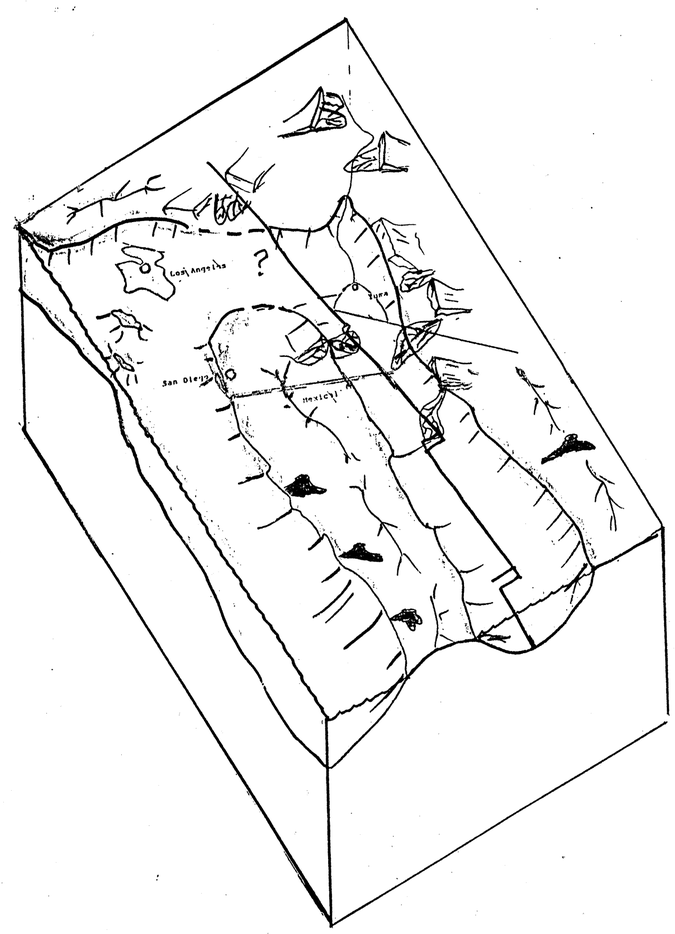
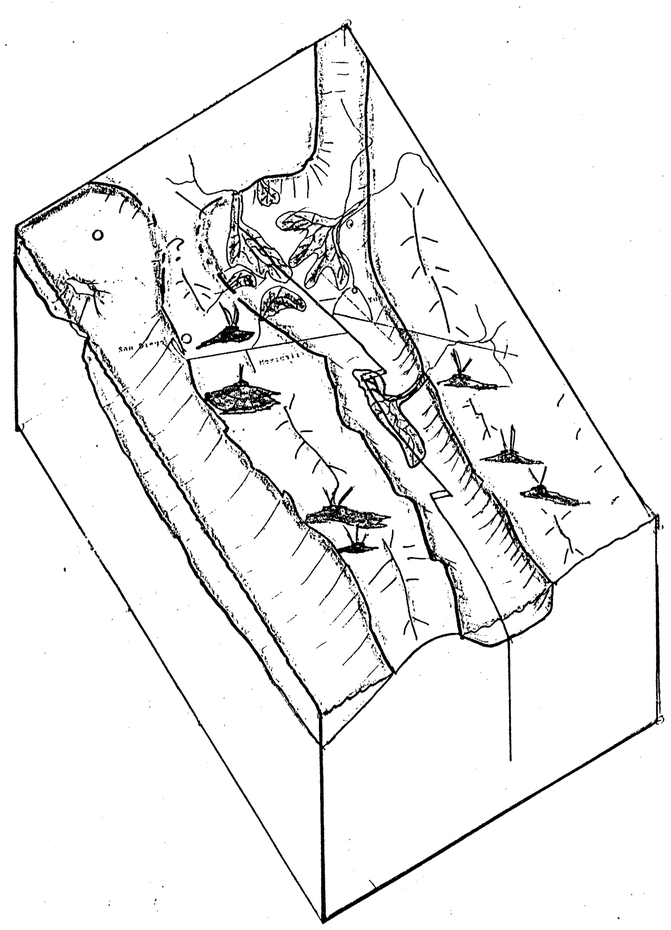


This cartoon represents geographic conditions at about 23.7 MYBP (beginning of the Miocene). The Gulf of California has opened and the San Andreas transform system is propogating northwestward. What is now the Los Angeles area lies at approximately the same latitude as the Yuma area.

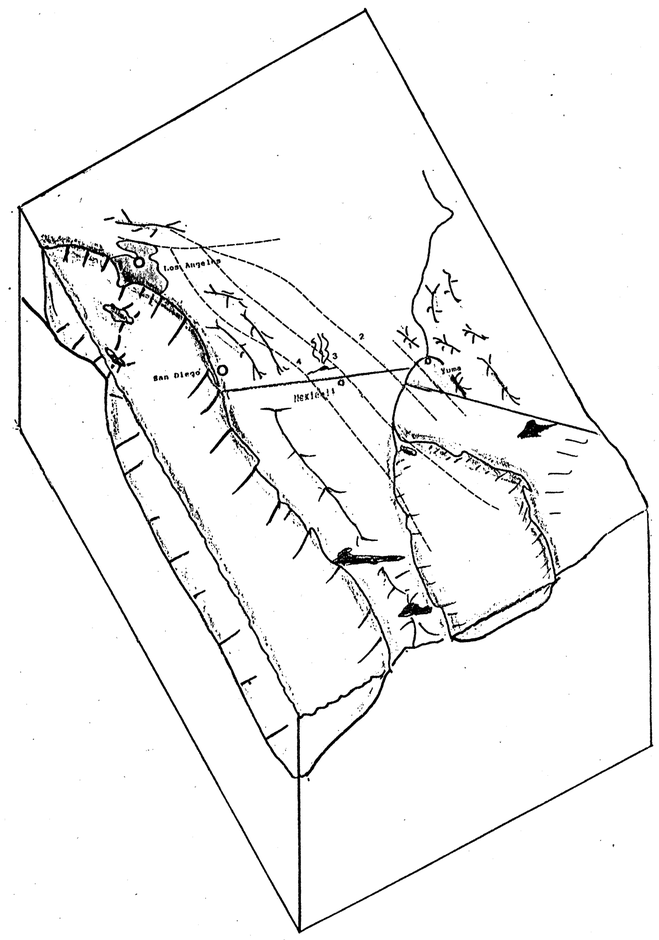
At about 16.6 MYBP (near the end of early Miocene) we see a large amount of uplift and block faulting. The Gulf of California has retreated southward due to the uplift. Locally, internal drainage deposited coarse clastics and volcanic debris in closed basins.



By the beginning of late Miocene, (11.2 MYBP) the region has subsided. The Gulf of California has reached to north of Yuma and may connect with the Pacific via the Los Angeles Basin. Sediments may include turbidites or submarine fans, but are dominantly fine-grained marine clastics.



In middle Pliocene (5.3 MYBP) the Gulf of California has been extended up what is now the Colorado River as far as Lake Mead. Marine shales and silts are predominant, but sands and conglomerates were being deposited as well. If there was a connection to the Pacific via the Los Angeles Basin, it has been filled with continental clastics.



At the present time, the Gulf of California has been forced back southward by the prograding Colorado River. Los Angeles is now about 300 miles northwest of the Yuma area.

These cartoons present a very simplified version of the geologic history of the Yuma area. The study area is rather small, but it is situated so as to have developed complex structures in only the past 30 million years. The area was affected as the Farallon plate collided with and was subducted under the North American plate. The Pacific plate followed, with its East Pacific transform zone.

The Yuma area was successively uplifted and extended, block faulted, lowered, and subjected to major lateral fault motion. Faulting is continuing at the present.