

and eastern Utah, but regional correlations remain uncertain. The list goes on and on, but one thing is clear - these maps and reports should provide a regionally coherent base from which to launch future, more detailed geologic studies.

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Laramide uplift of the Colorado Plateau in NW Arizona

The Hualapai and Coconino Plateaus in northwestern Arizona preserve Laramide-age arkosic sediments and partially exhumed fluvial channels incised into the tilted and erosionally beveled margin of the southwestern Colorado Plateau. The Paleogene surface is buried under late Oligocene to middle Miocene volcanic rocks at several localities. A 1200-meter-deep major paleocanyon is incised into Proterozoic bedrock along the downthrown side of the modern trace of the Hurricane fault in Peach Springs Canyon. Gravel clasts in the late Cretaceous(?)–Paleogene canyon fill preserve a record of Laramide erosional unroofing in which clasts of Proterozoic rocks increase in percentage upward in stratigraphic sections. Laramide volcanic clasts in similar arkosic gravels preserved east of the Hurricane fault increase to more than 50 percent of total clasts near the tops of some sections. The volcanic clasts record syntectonic volcanism and sedimentation coincident with Laramide deformation, probably beginning in late Cretaceous time. Ages of 14 randomly selected volcanic clasts range from 64 to 117 Ma, with the majority falling in the interval from 72 to 84 Ma. This upsection increase in volcanic clasts probably records the late Cretaceous migration of the volcanic arc toward the modern Plateau margin late in the period of arkose deposition.

Sixty kilometers south of Grand Canyon, a 30-meter-thick freshwater limestone within the Laramide arkosic sediments contains fossil charaphites, stromatolites and gastropods, including *Viviparus*, *Physa*, and *Lioplacodes*. These gastropods are similar to the suite of Genera found in the Paleocene-Eocene rocks of SW Utah, such as the Claron Formation. The early Tertiary lake extended at least 17.5 km in an east-west direction.

The age of the arkosic sediments, along with evidence of younger extensional backtilting of the Laramide channels, indicates that the edge of the Colorado Plateau in Arizona was previously higher than the existing 1200 meters above contemporaneous sea level when channel incision occurred in late Cretaceous or Paleocene time. The amount of inferred Laramide regional northeast tilting is of the same order of magnitude as the paleoslope preserved by structure contours on the Kaibab Formation in northern Arizona.

Although these data cannot entirely preclude a small amount of late Tertiary uplift, there is no compelling evidence for significant late Miocene or Pliocene uplift of the southwestern margin of the Colorado Plateau in this part of northwestern Arizona. The existing topographic relief along the western border of the Hualapai Plateau is approximately equal to the structural offset recorded in the extensional displacement of the Miocene Peach Spring Tuff. The Laramide structural history recorded in the Cretaceous(?)–Paleogene sections in Arizona is similar to the more detailed tectonostratigraphic record in southwestern Utah for a comparable time interval.