Gallery of geology - Zuni Salt Lake maar

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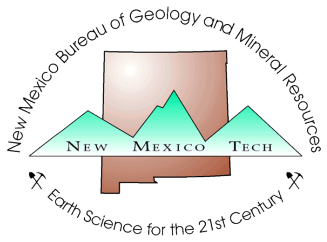

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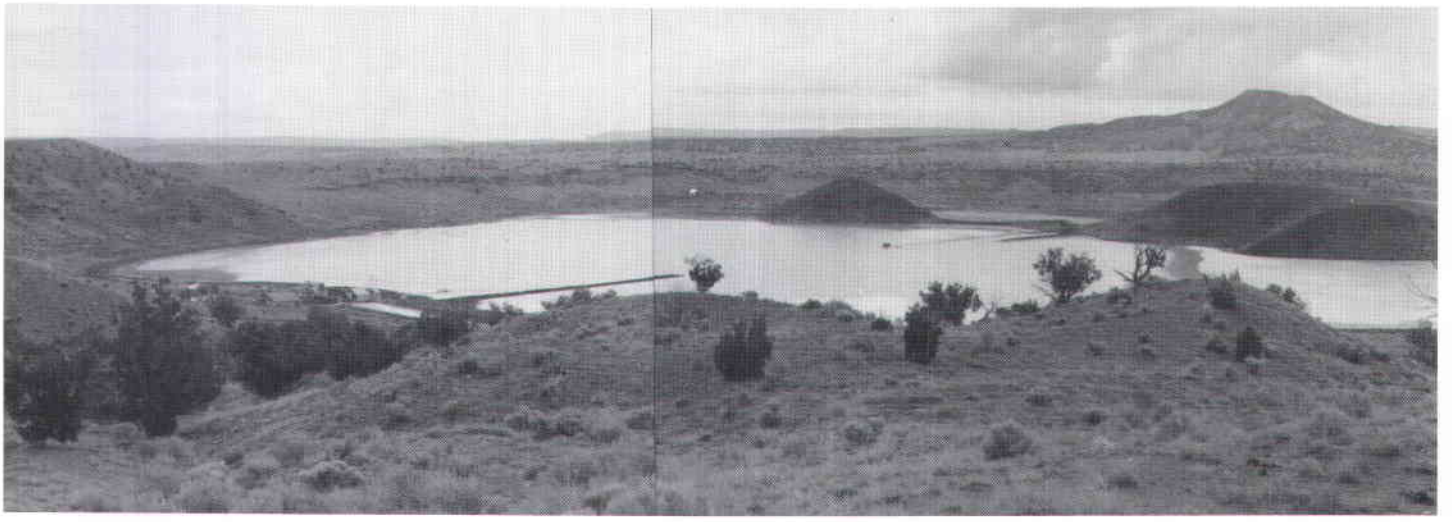
Zuni Salt Lake maar



Located 18 mi northwest of Quemado (Catron County), Zuni Salt Lake is approximately 1 mi in diameter with surrounding walls to 150 ft high. The crater formed about 23,000 years ago as the result of initial phreatomagmatic eruptions. Intermittent explosions followed, ending in cinder eruptions that formed the three cinder cones along the lake's south margin.

The country rock in which the maar developed consists of Upper Cretaceous marine, marginal-marine, and deltaic strata of the Mancos, Atarque, and Moreno Hill Formations. Blocks of the Atarque Sandstone in the ejecta just northwest of the lakeshore contain a characteristic Turonian bivalve fauna. Deep-seated northeast-trending faults in the country rock underlie a belt of cinder cones and maars, of which Zuni Salt Lake maar is the northmost. The faults apparently cut Permian evaporites (Yeso or Supai Formation), which lie at moderate depth and are the source of the brines that rise to the lake along fault-controlled conduits.

There are actually two salt lakes in the maar, both supported by saline springs and runoff. The larger lake has total dissolved solids of about 206,000 ppm, whereas the smaller pool, in the largest of the three cinder cones, has dissolved solids of about 100,000 ppm. At the time of initial formation, which took place during the more humid climate of the Late Pleistocene, the larger lake was a brackish waterbody about three times its present size and was inhabited by diatoms, algae, ostracods, and gastropods. Today, under drier climates with higher evapotranspiration rates, this smaller, more saline lake supports bacteria, algae, brine shrimp, and shore flies.

Don Juan de Oñate visited the lake in 1598, describing it as one of the "salinas famosas mejores que Christianos han descubierto" (famous salt pans, the best discovered by Christians). Salt has been recovered from Zuni Salt Lake by humans for at least 1,000 yrs, but the plant built in the 1930s, still visible on the lake's north shore, is abandoned.

J. P. Bradbury (University of New Mexico, PhD dissertation, 1967) undertook a comprehensive study of Zuni Salt Lake maar, and D. Cummings (U.S. Geological Survey, Miscellaneous Investigations Map I–544, 1968) mapped it at a scale of 1:6,000. W. E. Elston and K. H. Wohletz (Geological Society of America, DNAG Centennial Field Guide, v. 2, 1987) published a brief review.

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