



Mojave Desert Geomorphic Province



Photo: California State Parks

The Mojave Desert is a broad interior region of isolated mountain ranges separated by expanses of desert plains. Sometimes referred to as the high desert, elevations in the Mojave Desert generally range between 3,000 to 6,000 feet. Because of the enclosed interior drainage, rainwater either seeps into the ground or is evaporated, resulting in many playas. Within the province, there are two important fault trends that control topography: a prominent northwest trend and a secondary east-west trend (an apparent alignment with the Transverse Ranges).

Tectonic Setting

The rocks in the Mojave Desert are progressively older from the west toward the east. Some of the oldest rocks (about 1.7 billion years old) in California are exposed in the eastern Mojave Desert. Here also are remnants of what was the western continental shelf during the formation of the Appalachian Mountains and the Pangaea supercontinent.



The Mojave Desert geomorphic province's wedge-shaped appearance is due to the Garlock Fault along its northern boundary (the southern boundary of the Sierra Nevada) and the San Andreas Fault along the southern boundary. Like the Basin and Range geomorphic province, this region has been growing from east to west. It is also being sliced north to south along a set of faults (the eastern California shear zone) that operate similar to and parallel with the San Andreas Fault.

GeoGem

Providence Mountains State Recreation Area and **Picacho State Recreation Area** are the GeoGems representing the vast and complex Mojave Desert that spans so much geologic time. Within Providence Mountains State Recreation Area, Mitchell Caverns is a National Natural Landmark and in a way epitomizes the geomorphic province's very long connection to global geologic events. In this very arid desert, the limestone (deposited as much as 299 million years ago on the continental shelf, then accreted onto the continent) has intermittently dissolved during periods of high groundwater that coincide with glacial periods as recently as 11,500 years ago. The dissolved minerals then precipitated as cave formations with chemical signatures of the changing climate. These recordings of the Ice Ages are preserved in the cave formations in Mitchell Caverns.

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Simplified Geologic Map | Mojave Desert Geomorphic Province



