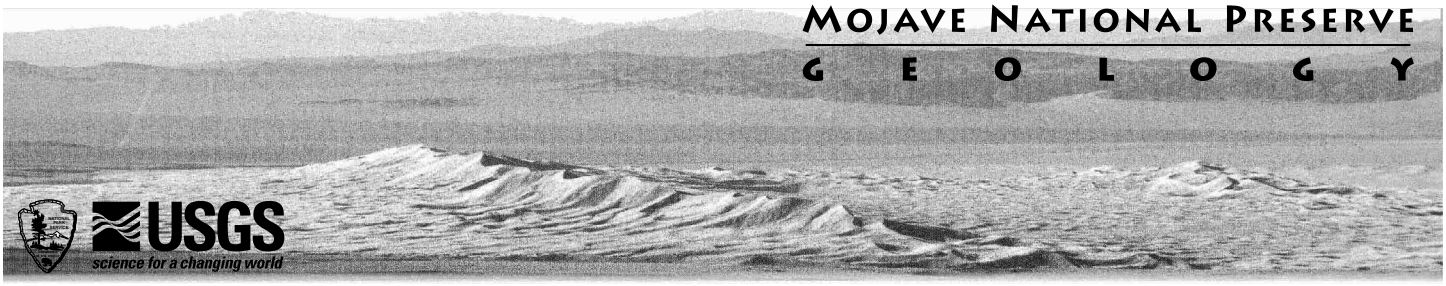


Hole-in-the-Wall

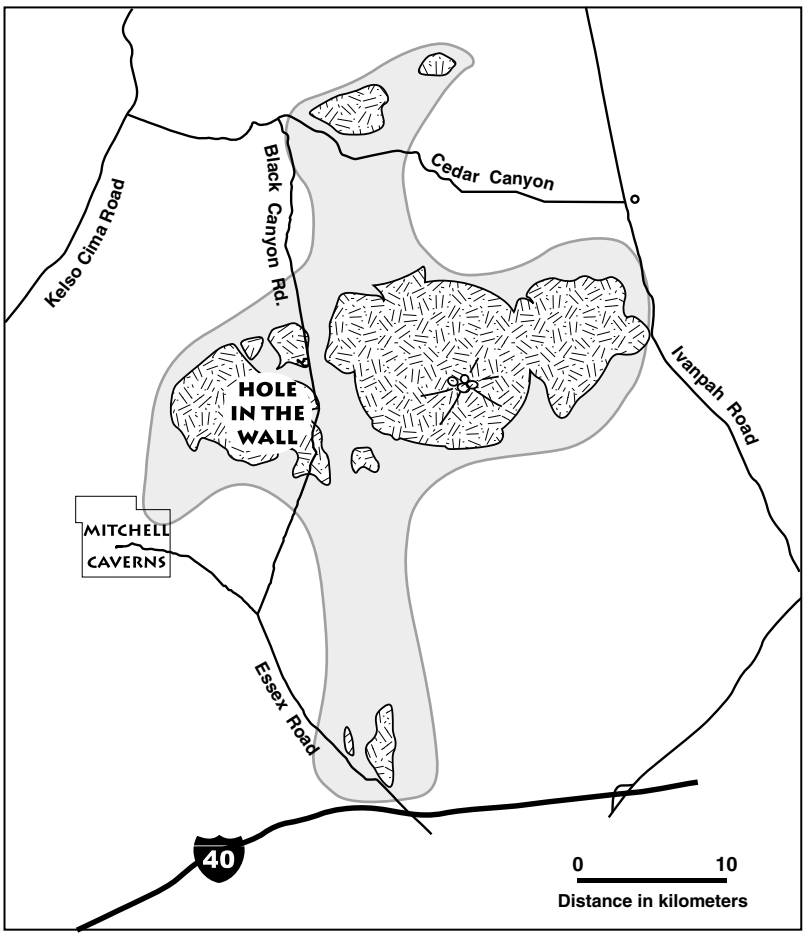
Visitors to Mojave National Preserve are fascinated by the brightly colored, fantastically sculpted rocks at Hole in the Wall. Hidden these intricate forms are clues that reveal an extraordinarily violent episode in Mojave's geological past.

HIDDEN VIOLENCE

About 18.5 million years ago, a powerful volcanic eruption blasted outward from the nearby Woods Mountains. Propelled by the force of rapidly rising and expanding gasses, aground-hugging cloud of ash and rock fragments spread out at near super-sonic speeds across the countryside. Some of the rocks thrown out by the blast are 14-20 meters (60 feet) across - the largest ever documented! An area of over 600 km^2 was covered with ash and rock fragments so hot that they welded together after they reached the ground. Almost instantly, hot, suffocating ash buried every living thing in the path of the blast. Whatever birds, mammals, and plants once flourished in Mojave Preserve at that time now lie entombed beneath the volcanic tuff that forms the colorful cliffs of Hole in the Wall.

WOODS MOUNTAINS VOLCANIC CENTER SPUTTERS TO LIFE

This devastating volcanic episode began just 18.5 million years ago and was centered just east of Hole in the Wall. The intriguing volcanic rock formations of Hole in the Wall are but a small remnant of the original Woods Mountains volcanic center. Geologist Mike McCurry and others have pieced together evidence that tells the story of this exciting period in Mojave National Preserve's history.



The first hint of what was to come may have been earth-shaking tremors. Molten rock, magma, made its way from deep within the crust toward the surface, nudging the rock and generating earthquakes. The first magma to reach the surface exploded from several vents. Initial eruptions blanketed the region with up to 200 meters of volcanic flows and tuff. Great masses of sticky (viscous) rhyolite lava oozed up and solidified to form volcanic domes and flows (Hackberry Spring volcanics).

Although these thick volcanic deposits would have wiped out virtually all life beneath them, they had relatively mild effects compared with what was to come next...

This map shows wide swath of land (shown in gray) smothered by lava flows and welded volcanic debris at Woods Mountains volcanic center. Ash was probably deposited over a much larger region. Major source vents are located to the east of Hole in the Wall. Even 17 million years later, much of the original rock produced by these eruptions remains. Remnants of tuff and other volcanic rocks can still be seen at the patterned areas indicated on the map.

Draft version 2/99 Hole-in-the-Wall. This site bulletin is a joint product of the US Geological Survey and the National Park Service