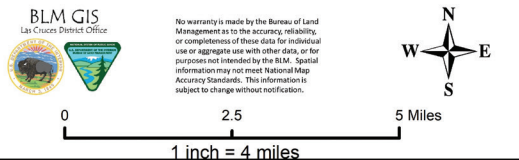


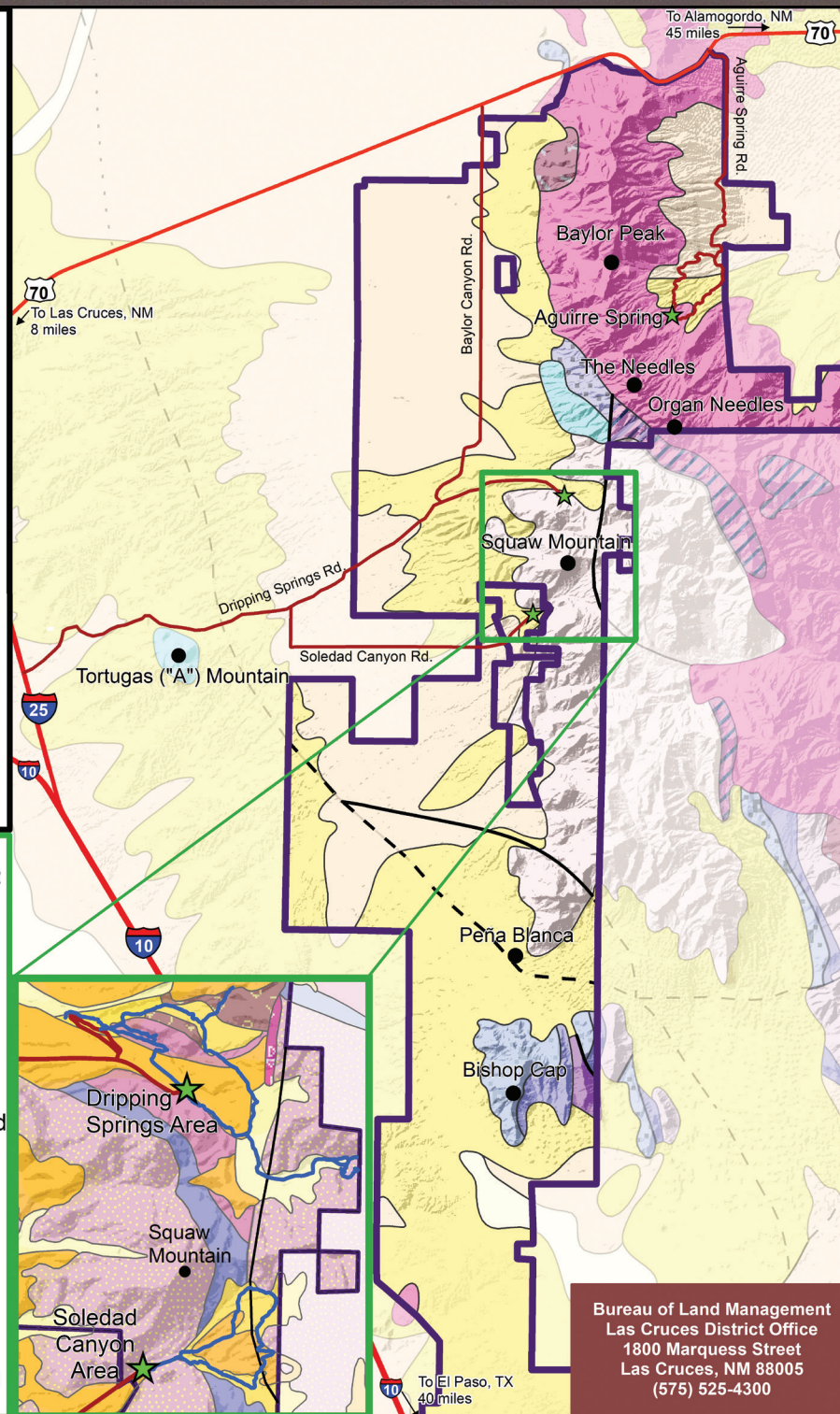
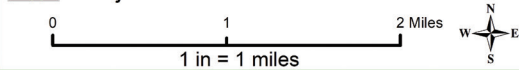
# Geology of the Organ Mountains<sup>1</sup>

- ★ Recreation Areas
- ▭ Monument Boundary
- Organ Monument Geology**
- fault [concealed]
- fault [exposed]
- Quaternary Piedmont alluvial deposits
- Plio-Pleistocene Upper Santa Fe Group
- Eocene rhyolitic lavas and local tuffs
- Eocene Andestic Lavas
- Eocene Quartz Monzonite
- Permian Hueco Group
- Pennsylvanian rocks, undivided
- Pennsylvanian Panther Seep Formation
- Mississippian and Devonian, undivided
- Silurian and Ordovician, undivided
- Mesoproterozoic granitic plutonic rocks



## Detailed View of the Dripping Springs and Soledad Canyon Area<sup>2</sup>

- ★ Recreation Areas
- Recreation Trails
- ▭ Monument Boundary
- Geology of Recreation Areas**
- fault [exposed]
- Younger Piedmont Slope Deposits
- Piedmont Slope Erosion Undifferentiated
- Camp Rice Formation
- Silicic Plutonic Rock
- West-Side Lavas
- Tuff of Squaw Mountain
- Tuff of Achenback Park
- Tuff of Cox Ranch and Cueva Tuff
- Orejon Andesite



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# Geology of the Organ Mountains

Organ Mountains—Desert Peaks  
National Monument

Footnotes: 1: New Mexico Bureau of Geology and Mineral Resources, 2003, Geologic Map of New Mexico, Scale 1:500,000.  
2: Seager, W.R.; Kottowski, F.E.; Kelley, S.A., 1987, Geology of East Half of Las Cruces and North El Paso 1 degree by 2 degree Sheets, New Mexico Scale 1:125,000

## Before the Mountains

The Organ Mountains preserve a complicated and explosive history. During the Paleozoic Era (541-251.9 million years ago), this area was a shallow tropical sea, home to numerous invertebrates whose fossils are still found today in the shales and limestones west of the Organ Needles, and at Bishop Cap.

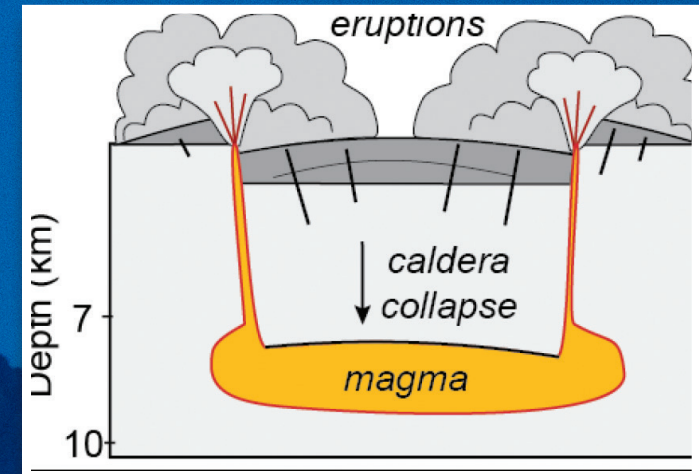
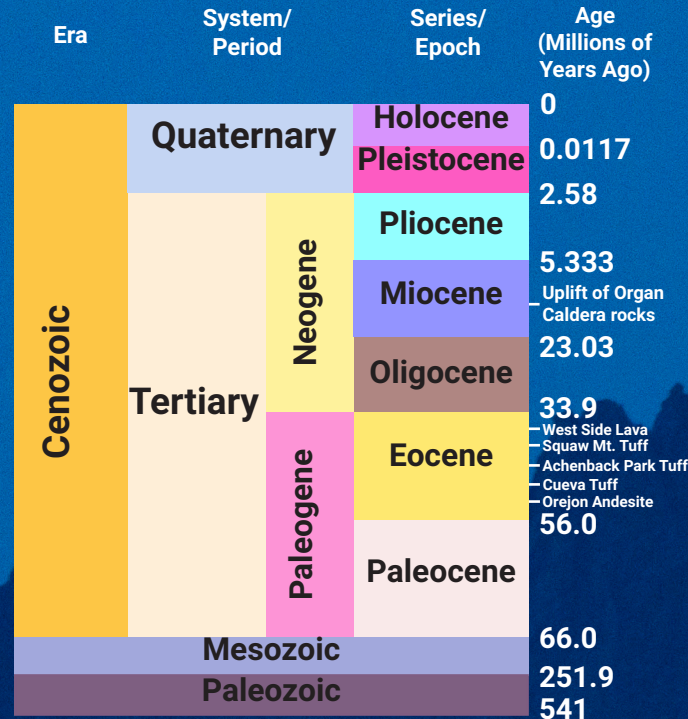
Most of the rocks that make up the Organ Mountains were formed by the Organ caldera volcano about 36 million years ago during the Eocene Epoch. At that time, large volumes of silica-rich magma intruded into the upper crust at depths of about 7-9 km (4.3- 5.6 miles) below Earth's surface. Magma erupted explosively three times from this volcano; each eruption larger than the more recent eruptions of Mount St. Helens (1980) and Mount Pinatubo (1991). The very large volumes of erupted magma resulted in the collapse of the ground overlying the magma chamber each time. Such collapse is common in large-volume volcanic eruptions. The resulting roughly-circular volcanic depression is known as a caldera. The next oldest rocks – known as “Orejon Andesite” – are a series of dark, crystal-rich exposed lava flows approximately 43 million years old that are found in Fillmore Canyon. These are thought to be associated with volcanoes that predate the Organ Mountains caldera.

No rocks from the Mesozoic Era, the era of the dinosaurs 251.9-66 million years ago, are preserved in the Organ Mountains.

## The Eruptions

The first volcanic eruption that occurred an estimated 36.5 million years ago produced a light-colored tuff rock that formed from a fast-moving mixture of hot gases, ash, and rock particles. Now known as The Cueva Tuff, it can be seen in dramatic form at La Cueva, just west of the A. B. Cox Visitor Center at the Dripping Springs Natural Area and at Peña Blanca. Eruption of the Achenback Park Tuff and then the Squaw Mountain

Tuff followed, respectively, 36.2 million years ago and 36 million years ago. The Squaw Mountain Tuff was the largest eruption and produced the volcanic deposits. The thick, dark-purple rocks of this tuff are exposed at Dripping Springs. The last known eruptions from Organ caldera occurred 36-35.7 million years ago – the West Side Lavas – are exposed in small hills on the west side of the Sierra Vista Trail between Soledad Canyon Road and Dripping Springs Road.



## Magma

After the eruptions ceased, the magma still flowed below Earth's surface. It cooled and crystallized, forming a plutonic rock with large, interlocking crystals ("granite").

In the Miocene Epoch, the crust in southern New Mexico began extending and faulting in association with the Rio Grande Rift starting about 18 million years ago. This caused tilting and uplift of the Organ caldera rocks. Because of this faulting, we have the unique opportunity to see both the cooled magma chamber (the plutonic rocks) exposed in the northern part of the Organ Mountains and the volcanic rocks in the south.

Continued tilting and erosion of these rocks has given us the beautiful jagged peaks of the Organ Mountains that we see today.

