The Jornada Lava Field and Bat Caves

One of Socorro County's hidden gems is the Jornada lava field and bat caves. Not exactly a big secret, but due to its remote location on Ted Turner's Armendaris Ranch, few people have been there.

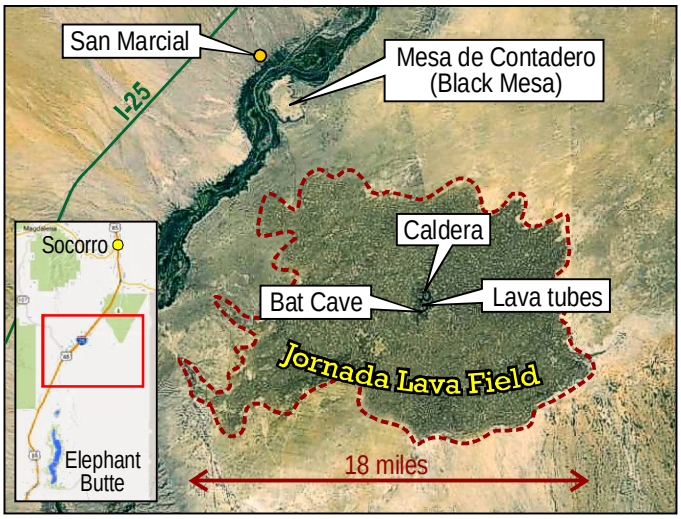
It takes several long hours of driving on dirt roads and windy paths across miles of lava just to get there. The area is a massive lava flow and a solid lava cap over 12 by 18 miles in size on the east side of the Rio Grande. The caldera is located about 15 miles southeast from San Marcial and the Black Mesa area with portions of the ancient lava flows reaching the Rio Grande.

Recently, Paul Harden had the pleasure of guiding a small team of geologists from New Mexico Tech to the lava field, the caldera, and the associated bat caves (with ranch permission). Paul was accompanied by Craig Hennies and SCHS Board member Dr. Peggy Hardman, under training as certified ranch guides. The geology team was led by SCHS member Dr. David Love, the Principal Senior Environmental Geologist at NMT, accompanied by Senior Volcanologist Bill McIntosh and Research Associate Matt Zimmerer.

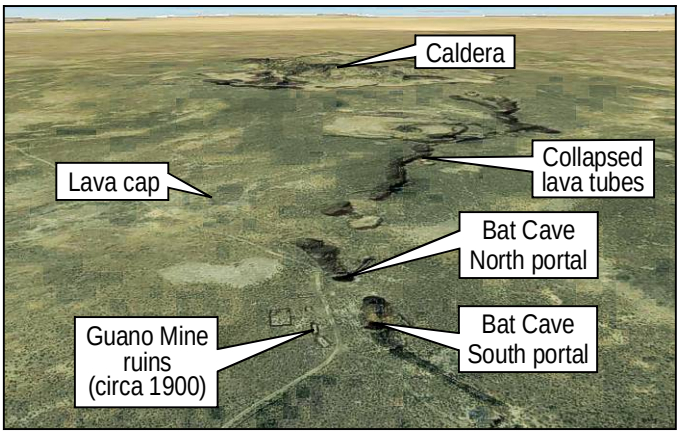
The lava flows are located in the waterless expanse of the famed Jornada del Muerto, and hence the name, Jornada lava field. The trip was in June with temperatures well over the 100 degree mark, and radiant heat from the black lava added to that, giving the "Journey of Death" a new appreciation. Leaving Socorro about 9 a.m., we finally arrived near the caldera about 2 p.m. The geologists quickly began the hike to collect lava samples from inside the crater, a steep climb up the lava walls of the caldera.

It is from this caldera that 200 square miles of lava, many tens of feet thick, changed the face of the Jornada desert. In spite of the size of this prominent lava feature, little research has been conducted, and certainly none recently. This leaves many lingering questions: Was it a single lava eruption or several? How long ago were the eruptions? How long did the eruptions persist? Is it associated with other nearby lava flows? Did the lava flow alter the course of the Rio Grande? And, many more.

View of one of the collapsed lava tubes, leaving a cave or tunnel, with the caldera in the distance.



Location of the Jornada Lava Field from GoogleEarth



Closer look at the caldera, lava tubes, and bat cave

Dr. Dave Love taking samples and photographing the lava flows

To answer some of these questions was the purpose of this and two others trips. In addition to surface analysis and mapping, lava samples from different areas were also collected for testing and dating.

Dating lava has always been a rough estimate, at best, using radioactive carbon dating and other

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legacy methods. However, geology, like all sciences, has seen many recent improvements in technology and techniques in performing such testing. The new geology building on the NMT campus has several new labs with state of the art equipment to perform more accurate lava dating and analysis. Once the labs are fully operational, dating of the Jornada lava samples should give geologists a much better picture of the age and evolution of these historic eruptions.

Some Initial Findings

The Jornada lava field does not appear to be the result of a single event, but several. Surface inspection in certain areas reveal apparently three distinct eruptions and flows over a period exceeding a million years. When the lava solidified, winds over many tens of thousands of years deposited a layer of small pebbles, dirt, and sand over the lava many feet thick. There are places where layers of lava, separated by layers of the deposited dirt, indicate at least three episodes of the Jornada caldera spewing out lava. Dating the lava from these different layers should allow a more precise date of when these three eruptions occurred.

Furthermore, dating the lava layers near the caldera source with the more distant layers might indicate how long the lava eruption persisted. Did the lava flow for months, years or decades?

Along the western edge of the lava fields are found areas of smooth, water worn rocks and pebbles. Known as "ancestral Rio Grande," this is indicative of the ancient river bed. This identifies where the Rio Grande once flowed many miles east of where the course lies today. Dating the lava in these areas, and whether above or below the ancient river bed, might confirm if the Rio Grande got pushed further to the west by the lava flows or other natural processes.

As the hot lava flowed away from the caldera, some flows formed rivers. The outer walls and tops of the flowing lava river cooled and solidified, forming solid tubes. Inside, the hot lava continued to flow, much like blood flowing through arteries. When the eruption ceased, the hot lava drained out of the tubes, leaving giant empty lava tubes some 30–100 feet in diameter. These lava tubes formed "tunnels" many miles long.

A section of a collapsed lava tube, with a small intact portion forming a narrow arch.

Over the millennia, some of the roofs of the tubes have collapsed, leaving huge lava trenches, or canyons, in the otherwise flat desert. The lava tubes that remain intact form long tunnels or caves.

The Jornada Bat Cave

One of these intact sections of lava tubes, about 600 feet in length, has become home to millions of Mexican free-tail bats. It is considered one of North America's best undisturbed bat caves with a summer population of 3–4 million bats (compared to Carlsbad Caverns 400,000 for 2015). Indications are the Jornada bat colony has been there for millennia.

The evening bat flight, with over a million bats leaving the caves, is a sight to behold. Some photos of this natural wonder are on the following page, but a sampling of the 45-minute long spectacle.

Craig exploring the entrance to an intact lava tube that also forms one end of the Jornada bat cave.

A Dave Love photo inside the caldera and the crater. The caldera is about one-third mile across.

Geologists Matt (left) and Bill (right) explaining to Peggy and Paul some of their preliminary findings.

Mexican free-tail bats beginning to leave the cave for their evening flight ritual. Emerging from the cave, the setting sunlight makes the black bats appear white.

Watching the bats begin their flight was indeed a sight to behold in awe – and to photograph. Flying right over one's head, it sounded like a fluttering wind.

Within minutes, countless thousands of bats have taken to the skies, flying in a unique formation.

The bats fly over the Fra Cristobal mountains to Elephant Butte Reservoir, a distance of over 18 miles.

A really lucky shot . . .

Craig Hennies managed to capture an amazing sight. A hopeful hawk suddenly appears looking for dinner. With a graceful glide and talons extended, the hawk snags an unsuspecting bat. With a quick flap of his wings, the hawk abruptly turned and was quickly long gone. A truly graceful encounter to witness.

A nice video showing some of the bat flight was captured by Craig and placed on YouTube at: https://www.youtube.com/watch?v=WaOiXy9_iak
or, go to http://www.youtube.com and search for "Armendaris Bat Cave"