A Field Trip to Explore the Geology of the Jemez Mountains

The Rio Grande Rift in central New Mexico is a place where the earth's crust has been stretching for the past 40 million years, resulting in highly extended "basin-and-range" terrain (stretched, broken, and tilted the earth's crust in this area to form fault-block ranges and intervening sedimentary basins). This geologic history has also involved a variety of volcanic eruptions and landscapes, with one of the most spectacular volcanic fields being the Jemez Volcanic Field and Valles Caldera. Although the Jemez Volcanic Field has erupted intermittingly for at least 16 million years, the present-day landscape of the Valles Caldera is the result of the collapse of 1.2-million-year-old supervolcano eruption, which produced extremely explosive eruptions and the outpouring large-scale ash, pumice, and pyroclastic flows. The most recent volcanic eruption is only 68,000 years ago, and may present the beginning of a new cycle of volcanic activity. The Caldera displays classic hydrothermal features like those of Yellowstone National Park, including sulfuric-acid hot springs, fumaroles, and steaming mudpots.

Our field trip will be led by IWF NM member Dr. Nelia Dunbar (New Mexico State Geologist Emerita). We will explore the fascinating geology of the Jemez Volcanic Field area, starting at the White Rock Canyon overlook and ending in the quaint village of Jemez Springs, where geothermal springs are heated by the volcano. We will have an optional stop for dinner and beverages at Los Ojos Restaurant and Salon in Jemez Springs. Also, if we arrive early enough in Jemez Springs, some participants may want to take a soak in the thermal water at one of two commercial bath houses.

STOP 1: **White Rock Canyon Overlook**. We will meet at the overlook at 8:00 am and discuss the area's regional geology and volcanic history. At this stop, we will also discuss the history of the Rio Grande and the past dramatic interaction between the river and volcanic eruptions. Light breakfast will be provided.

STOP 2: **Cerro La Jara hike.** This stop provides an overview of the spectacular Valles Caldera, formed by a major volcanic supereruption that occurred 1.2 million years ago. At this stop, we will discuss the area's volcanic history and take an easy 1.5-mile hike around the tiny volcanic dome called Cerro La Jara.

STOP 3: **Valles Caldera National Preserve Visitor's Center**. The new visitor's center has wonderful displays that illustrate the volcanic history along with providing information about the caldera's ecology and fire history.

STOP 4: **Las Conchas Day Use Site**. This will be the lunch stop and will allow anyone interested to do short, scrambly hike into the heart of the South Mountain Rhyolite Dome.

STOP 5: **Battleship Rock**. Here, we will explore the youngest volcanic activity in the Jemez Mountain Volcanic Field. We will take two short hikes. One to visit a classic example of welded tuff, exhibiting a type of flattened pumice called fiamme, and the second to a waterfall on the West Fork of the Jemez River.

STOP 6. (time/weather permitting): **Soda Dam.** This mound of calcium carbonate and travertine was formed by thermal waters upwelling along a fault. Warm water continues to upwell today, although the former flow paths were disrupted by highway construction. The thermal waters mix with the water of the Jemez River, resulting in different water chemistry upstream and downstream of Soda Dam.