

Threatening 22 million people, Mexico's Popocatepetl is a very closely watched volcano

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A plume of ash and steam rises from the Popocatepetl volcano, as seen from Mexico City, Wednesday, June 19, 2019. Popocatepetl rumbled to life again this third week of May 2023, spewing out towering clouds of ash that forced 11 villages to cancel school sessions. Credit: AP Photo/Marco Ugarte, File

Mexico's Popocatepetl volcano rumbled to life again this week, belching out towering clouds of ash that forced 11 villages to cancel school sessions.

The residents weren't the only ones keeping a close eye on the towering peak. Every time there is a sigh, tic or heave in Popocatepetl, there are dozens of scientists, a network of sensors and cameras, and a roomful of powerful equipment watching its every move.

The 17,797-foot (5,426-meter) volcano, known affectionately as "El Popo," has been spewing toxic fumes, ash and lumps of incandescent rock persistently for almost 30 years, since it awakened from a long slumber in 1994.

The volcano is 45 miles (72 kilometers) southeast of Mexico City, but looms much closer to the eastern fringes of the metropolitan area of 22 million people. The city also faces threats from earthquakes and sinking soil, but the volcano is the most visible potential danger—and the most closely watched. A severe eruption could cut off air traffic, or smother the city in clouds of choking ash.

Ringed around its summit are six cameras, a thermal imaging device and 12 seismological monitoring stations that operate 24 hours a day, all reporting back to an equipment-filled command center in Mexico City.



Paulino Alonso Rivera, who works at the National Center for Disaster Prevention of Mexico, gives an interview as he monitors the Popocatepetl volcano, in Mexico City, Feb. 8, 2023. Every time Mexico's Popocatepetl volcano rumbles to life and belches out towering clouds of ash, there are dozens of scientists, a network of sensors and cameras and a roomful of powerful equipment watching its every move. Credit: AP Photo/Marco Ugarte, File

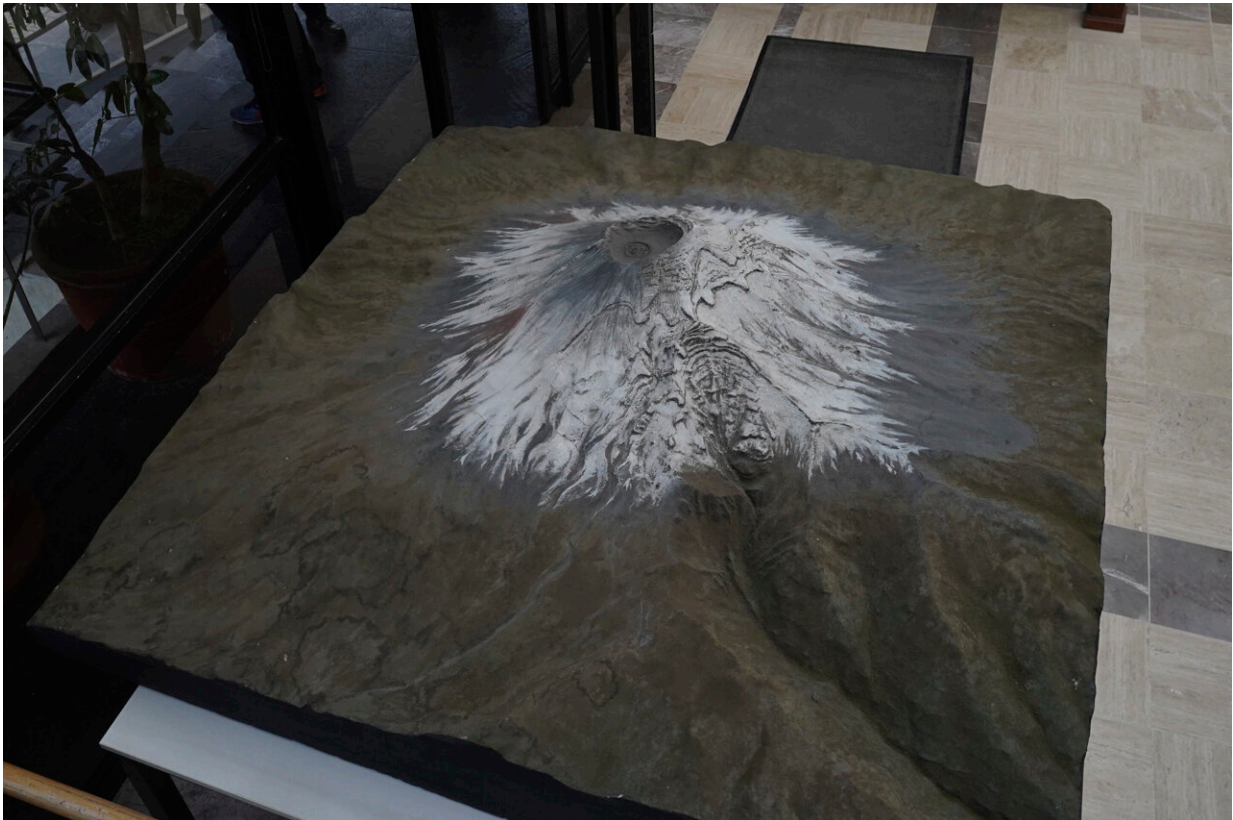
A total of 13 scientists from a multidisciplinary team take turns staffing the command center around the clock. Being able to warn of an impending ash cloud is key, because people can take precautions. Unlike earthquakes, warning times can be longer for the volcano and in general the peak is more predictable.

On a recent day, researcher Paulino Alonso made the rounds, checking

the readings at the command center run by Mexico's National Disaster Prevention Center, known by its initials as Cenapred. It is a complex task that involves seismographs that measure the volcano's internal trembling, which could indicate hot rock and gas moving up the vents in the peak.

Monitoring gases in nearby springs and at the peak—and wind patterns that help determine where the ash could be blown—also play a role.

The forces inside are so great that they can temporarily deform the peak, so cameras and sensors must monitor the very shape of the volcano.



A model of the Popocatepetl volcano is displayed at the National Center for Disaster Prevention of Mexico in Mexico City, Feb. 8, 2023. The 17,797-foot mountain is known affectionately as “El Popo” and has been belching toxic fumes, ash and lumps of incandescent rock persistently for almost 30 years.

Credit: AP Photo/Marco Ugarte, File

How do you explain all of this to 25 million non-experts living within a 62-mile (100-kilometer) radius who have grown so used to living near the volcano?

Authorities came up with the simple idea of a volcano "stoplight" with three colors: green for safety, yellow for alert and red for danger.

For most of the years since the stoplight was introduced, it has been stuck at some stage of "yellow." The mountain sometimes quiets down, but not for long. It seldom shoots up molten lava: instead it's more the "explosive" type, showering out hot rocks that tumble down its flanks and emitting bursts of gas and ash.



The National Center for Disaster Prevention of Mexico, which monitors the Popocatepetl volcano, in Mexico City, Feb. 8, 2023. The 17,797-foot (5,426-meter) volcano, known affectionately as “El Popo,” has been belching toxic fumes, ash and lumps of incandescent rock persistently for almost 30 years, since it awakened from a long slumber in 1994. Credit: AP Photo/Marco Ugarte, File

The center also has monitors in other states; Mexico is a country all too familiar with natural disasters.

For example, Mexico's earthquake early alert system is also based at the command center. Because the city's soil is so soft—it was built on a former lake bed—a quake hundreds of miles away on the Pacific coast can cause huge destruction in the capital, as happened in 1985 and 2017.

A system of seismic monitors along the coast sends messages that race faster than the quake's shock waves. Once the sirens start blaring, it can give Mexico City residents up to half a minute to get to safety, usually on the streets outside.

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