

**(It was suppose to be carbon emissions causing this not water.)**

## **Tonga's Volcanic Eruption Sent So Much Water Into Stratosphere It Could Warm the Earth**

**By Brian Freeman**

The eruption of Tonga's Hunga Tonga-Hunga Ha'apai volcano in January released an unprecedented amount of water directly into the stratosphere that is equivalent to 10% of the normal amount of vapor found in the stratosphere and likely affected the Earth's climate patterns, NASA scientists say, according to [NPR](#).

This amount of water is similar to more than 58,000 Olympic-size swimming pools, the vapor of which is so vast that it will remain in the atmosphere for years. "We've never seen anything like it," said atmospheric scientist Luis Millán, who works at NASA's Jet Propulsion Laboratory and who led a study of the water the volcano sent into the sky that was published in [Geographical Research Letters](#).

The source of the eruption was from a volcano that is more than 12 miles wide and with a caldera sitting approximately 500 feet below sea level. The blast of the eruption sent ash, gases, and vapor as high as a record 35 miles into the atmosphere and caused a sonic boom heard as far away as Alaska, according to the study.

The researchers said in their paper that it usually takes some two to three years for sulfate aerosols from volcanoes to fall out of the stratosphere, but the water from this eruption could take five to 10 years to fully dissipate, which means that this "may be the first volcanic eruption observed to impact climate not through surface cooling caused by volcanic sulfate aerosols, but rather through surface warming." The researchers added that the eruption dramatically disrupted annual water patterns in the stratosphere, which is usually so reliable that scientists refer to it as a sort of tape recorder.

They stressed that "by short-circuiting the pathway through the cold point, [Hunga Tonga-Hunga Ha'apai] has disrupted this 'heartbeat' signal" in the planet's normal atmospheric water pattern.

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