

Example by StudyDriver

Source: <https://studydriver.com/how-volcanoes-influence-climate/>

How Volcanoes Influence Climate Example

Volcanic eruptions both cool and heat the earth. When a volcano erupts, dust, ash, and sulfur are released into the atmosphere. Depending on how light the particles are, some will travel to the stratosphere while larger ones will fall to the earth's surface. Small particles of dust and ash that remain in the stratosphere block the solar radiation hitting the earth, causing the planet to cool ("How Volcanoes Influence Climate", 2018). Due to the circulation pattern in the stratosphere, dust and ash can travel worldwide to locations far from which they erupted. This can last from month to years, depending on how big the particles are. Sulfur is also ejected into the atmosphere after volcanic eruptions. Sulfur travels to the stratosphere, where it merges with water. Once sulfur and water fuse, sulfuric acid aerosols form and create tiny droplets that reflect solar radiation, cooling the earth even more ("How Volcanoes Influence Climate", 2018). In contrast, volcanic eruptions can warm the earth by releasing large amounts of carbon dioxide, a gas that plays a major role in the greenhouse effect. These greenhouse gases play a role as an insulator, preventing large quantities of the warm gases to leave the earth. Volcanic eruptions generate 110 million tons of carbon dioxide every year ("How do volcanoes affect world climate?", 2005).

The Tambora volcano eruption in 1815 in Indonesia shot volcanic columns up to 80,000 feet high, making it the largest eruption in world history. The volcano showed its immediate effects when the hot lava and pyroclastic flow killed 10,000 people (Ames, 2017). The volcano affected the climate, making it known as the year without summer. The Tambora volcano released so much ash and aerosol into the atmosphere that the sky became a darker color and blocked solar radiation from hitting the earth. The particles were so small that they were able to circulate through the stratosphere to other parts of the world. The planet's temperature dropped 3 degrees Celsius ("How Volcanoes Influence Climate", 2018).

As said before, volcanic eruptions generate 110 million tons of carbon dioxide every year. Humans release 10,000 times more carbon dioxide than volcanoes ("How do volcanoes affect world climate?", 2005). Man-made anthropogenic processes are more significant to climate change. Climate drivers - such as volcanic eruptions and heat trapping in the atmosphere - are natural causes we cannot curtail. Human causes, such as vehicles, factories, and many other things human-operated, burn fossil fuels that travel into the stratosphere. In addition, humans are the ones to cut down the plants that absorb the carbon dioxide. Scientists are able to tell that humans play a large role in global warming because they are able to distinguish carbon dioxide derived from fossil fuels and carbon dioxide derived from natural resources by the concentration of atoms ("How Do We Know That Humans Are the Major Cause of Global Warming?", 2017). Over the past hundreds of years, scientists noticed an increase in carbon dioxide level derived from fossil fuels and an increase in global temperature from year to year ("How Do We Know That Humans Are the Major Cause of Global Warming?", 2017). There are almost 8 billion people in the world that burn fossil fuels everyday, making humans the main cause of global warming and climate change on planet earth.