

Chile earthquake may have shortened days

Seventh strongest quake in recorded history may have shifted Earth's axis



This view of Earth comes from NASA's Moderate Resolution Imaging Spectroradiometer aboard the Terra satellite.

NASA/JPL



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The massive 8.8 earthquake that struck Chile may have changed the entire Earth's rotation and shortened the length of days on our planet, a NASA scientist said Monday.

The quake, the **seventh strongest earthquake** in recorded history, hit Chile Saturday and should have shortened the length of an Earth day by 1.26 milliseconds, according to research scientist Richard Gross at NASA's Jet Propulsion Laboratory in Pasadena, Calif.

"Perhaps more impressive is how much the quake shifted Earth's axis," NASA officials said in a Monday update.

The computer model used by Gross and his colleagues to determine the effects of the **Chile earthquake** effect also found that it should have moved Earth's figure axis by about 3 inches (8 cm or 27 milliarseconds).

The Earth's figure axis is not the same as its north-south axis, which it spins around once every day at a speed of about 1,000 mph (1,604 kph).

The figure axis is the axis around which the Earth's mass is balanced. It is offset from the Earth's north-south axis by about 33 feet (10 meters).

Strong earthquakes have altered Earth's days and its axis in the past. The 9.1 Sumatran earthquake in 2004, which set off a deadly tsunami, should have shortened Earth's days by 6.8 microseconds and shifted its axis by about 2.76 inches (7 cm, or 2.32 milliarcseconds).

One Earth day is about 24 hours long. Over the course of a year, the **length of a day** normally changes gradually by one millisecond. It increases in the winter, when the Earth rotates more slowly, and decreases in the summer, Gross has said in the past.

The Chile earthquake was much smaller than the Sumatran temblor, but its effects on the Earth are larger because of its location. Its epicenter was located in the Earth's mid-latitudes rather than near the equator like the Sumatran event.

The fault responsible for the 2010 Chile quake also slices through Earth at a steeper angle than the Sumatran quake's fault, NASA scientists said.

"This makes the Chile fault more effective in moving Earth's mass vertically and hence more effective in shifting Earth's figure axis," NASA officials said.

Gross said his findings are based on early data available on the Chile earthquake. As more information about its characteristics are revealed, his prediction of its effects will likely change.

The Chile earthquake has killed more than 700 people and caused widespread devastation in the South American country.

Several major telescopes in Chile's Atacama Desert have **escaped damage**, according to the European Southern Observatory managing them.

A salt-measuring NASA satellite instrument destined to be installed on an Argentinean satellite was also undamaged in the earthquake, JPL officials said.

The Aquarius instrument was in the city of Bariloche, Argentina, where it is being installed in the Satellite de Aplicaciones Cientificas (SAC-D) satellite. The satellite integration facility is about 365 miles (588 km) from the Chile quake's epicenter.

The Aquarius instrument is designed to provide monthly global maps of the ocean's salt concentration in order to track current circulation and its role in climate change.