

Could a Colorado earthquake have been triggered by dinosaur extinction impact?

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A composite image of the Western hemisphere of the Earth. Credit: NASA

Researchers have found signs of fault displacement at well-known rock outcrops in Colorado that mark the end-Cretaceous asteroid impact that may have hurried the extinction of the dinosaurs. They will present their results in a poster at the 2017 Seismological Society of America's (SSA) Annual Meeting.

Norm Sleep of Stanford University and colleagues suggest that the [impact](#), which occurred near the Yucatán Peninsula of Mexico, could have generated massive seismic waves that triggered earthquakes as far away as Colorado, in the center of a tectonic plate where no previous [fault](#) had existed.

Sleep and his colleagues found evidence for the fault in two areas in Colorado's Trinidad Lakes State Park, where a layer of iridium generated by the asteroid impact clearly marks the boundary between Cretaceous and Tertiary-age rocks, at the time of the dinosaurs' extinction about 65 million years ago. At the Long's Canyon and Madrid Canyon roadcuts, "there is a fault that slipped about a meter at the time of the impact," Sleep said. "It offset the material below the impact layer but not above, but it's not something that would be obvious to the casual observer."

The researchers suggest that the Colorado [earthquake](#) may have been as large as magnitude 6. Very strong seismic waves from the impact—much larger than would be generated by a regular earthquake, Sleep said—would be necessary to trigger an earthquake in this location, in the middle of a tectonic plate with no previous faults.

The end-Cretaceous asteroid strike, however, could have generated ground velocities of a meter or two per second, Sleep said. "The ground would be moving up and down and sideways like a ship in a strong storm."

At the time of the earthquake, the area in Colorado was a swampy, delta-like environment, crossed by large braided streams that ran from the young Rocky Mountains. Sleep and his colleagues saw signs that the earthquake had diverted a small stream in the area.

This summer, the researchers will be checking in New Mexico near the Raton Basin for further signs of intraplate quakes that may have been triggered by the asteroid strike.

More information: "Induced Intraplate Earthquakes in Colorado from Extreme Seismic Waves from the End-Cretaceous Asteroid Impact" will be presented at the SSA Annual Meeting on Tuesday, April 18. All presentation abstracts for the 2017 SSA Annual Meeting can be accessed at meetings.seismosoc.org/abstracts

Provided by Seismological Society of America

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