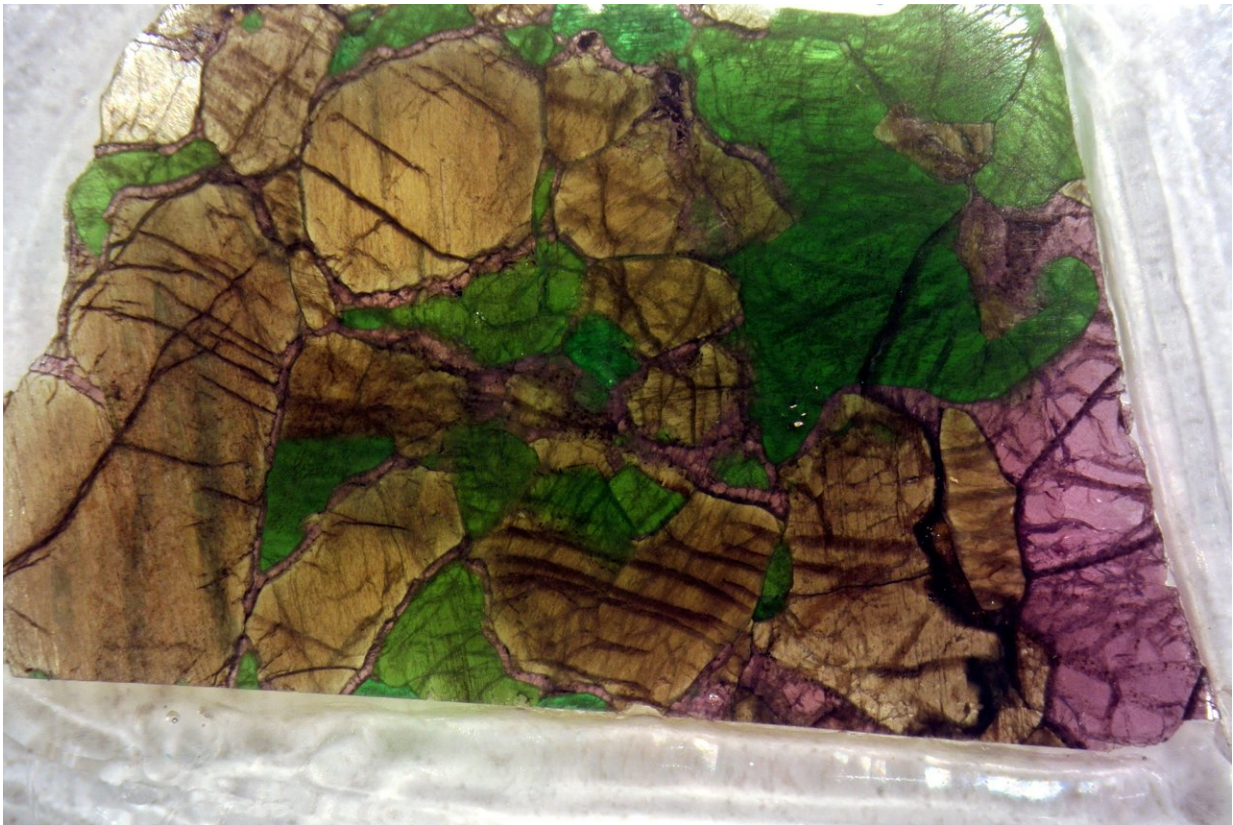


Geologists uncover new clues about largest mass extinction ever

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The photo depicts a sample of mantle xenolith, rock sections of the lithosphere that get captured by the passing magma and erupted to the surface during the volcanic explosion. Credit: Michael W. Broadley.

A new study could help explain the driving force behind the largest mass

extinction in the history of earth, known as the End-Permian Extinction.

The event, also known as the Great Dying, occurred around 250 million years ago when a [massive volcanic eruption](#) in what is today the Russian province of Siberia sent nearly 90 percent of all life right into [extinction](#). Geologists call this eruption the Siberian Flood Basalts, and it ran for almost a million years.

"The scale of this extinction was so incredible that scientists have often wondered what made the Siberian Flood Basalts so much more deadly than other similar eruptions," said Michael Broadley, a [postdoctoral researcher](#) at the Centre for Petrographic and Geochemical Research in Vandœuvre-lès-Nancy, France, and lead author of the paper.

The work, which was published in *Nature Geoscience*, was co-authored by Lawrence (Larry) Taylor, the former director of the Planetary Geosciences Institute at the University of Tennessee, Knoxville. Taylor, whose prolific career at UT spanned 46 years, passed away in September 2017 at age 79.

According to Broadley, "Taylor was instrumental in supplying samples of mantle xenoliths, rock sections of the lithosphere [a section of the planet located between the crust and the mantle] that get captured by the passing magma and erupted to the surface during the [volcanic explosion](#). Taylor also provided advice throughout the study."

Through the analysis of samples, Broadley and his team tried to determine the composition of the lithosphere. They found that before the Siberian Flood Basalts took place, the Siberian lithosphere was heavily loaded with chlorine, bromine, and iodine, all chemical elements from the halogen group. However, these elements seem to have disappeared after the volcanic [eruption](#).

"We concluded that the large reservoir of halogens that was stored in the Siberian lithosphere was sent into the earth's atmosphere during the volcanic explosion, effectively destroying the ozone layer at the time and contributing to the mass extinction," Broadley said.

More information: Michael W. Broadley et al, End-Permian extinction amplified by plume-induced release of recycled lithospheric volatiles, *Nature Geoscience* (2018). [DOI: 10.1038/s41561-018-0215-4](https://doi.org/10.1038/s41561-018-0215-4)

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