

Something old, something new... Grand Canyon surprises

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New thermochronologic data show that this segment of Grand Canyon (Marble Canyon, near Cape Solitude) was beneath several kilometers of rock strata, and hence was not carved, until the last 6 million years. This evidence falsifies “old canyon” hypotheses that Grand Canyon was carved in its same location and to within a few hundred meters of its modern depths by 50 million years ago. Instead, the paper presents a new “paleocanyon solution” that reconciles all datasets and shows that different segments of the modern Grand Canyon had different histories and became linked together by the Colorado River after 5-6 Ma to become the modern Grand Canyon. Credit: Laura Crossey, UNM

The Grand Canyon as we know it was formed between five and six million years ago, which is youthful in geological terms, but parts of it could be as old as 70 million years, scientists said Sunday.

Experts have debated for nearly 150 years about the age of the canyon, wrangling over how long it took for the grandiose feature to be gouged out by the Colorado River and its tributaries.

Reporting in the journal *Nature Geoscience*, researchers in the United States said they had dated [rock samples](#) from the length of the 446-kilometre (277-mile) canyon and used computer simulations of the topography in their new appraisal.

Two middle sections, called the Hurricane segment and the Eastern Grand Canyon segment, were formed between 50 and 70 million and between 15 and 25 million years ago respectively, they believe.

But two other sections are far younger—they were carved out only between five and six million years ago.

Their creation linked up all four segments, forming a single canyon.

Today, the canyon averages about 1,230 metres (4,000 feet) in depth, falling to around 1,850 metres (6,000 feet) at its deepest point and 29 kilometres (18 miles) at its widest.



Thermochronologic data indicate that the segment shown here (eastern Grand Canyon – the area visited by 5 million annual visitors to the GC National Park) was about half carved (to the level of the red cliffs above the hiker) between 25-15 million years ago. However, the inner gorge shown here was carved in the last 6 million years by the powerful Colorado River (note Horn Rapids). Credit: Laura Crossey, UNM

"Although parts of the canyon are old, we concluded that the integration of the Colorado River through older palaeocanyons carved the Grand Canyon, beginning five to six million years ago," said the study, headed by Karl Karlstrom, a geologist at the University of New Mexico at Albuquerque.

The paper reconciles two schools of thought.

One theory saw an "old" Grand Canyon that was formed as long ago as 80 million years, while the other argued for a "young" canyon five

million years old.

More information: Paper: [dx.doi.org/10.1038/ngeo2065](https://doi.org/10.1038/ngeo2065)

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