

# **Radioactive and Stable Isotopes in Deep Caves of Carlsbad Caverns National Park, New Mexico, USA**

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Lechuguilla Cave (478 m) and Carlsbad Cavern (316 m) are the two deepest known caves in Carlsbad Caverns National Park. While the two caves are nearby and of similar depth, host rock, and origin, they differ markedly in one respect. While Carlsbad has a large natural entrance, Lechuguilla has no known natural entrance, and the artificial entrance is equipped with an airlock to minimize atmospheric exchange.

We have analyzed water samples from both caves for radioactive and stable isotopes. In Lechuguilla, we've found elevated <sup>36</sup>Cl levels associated with global nuclear fallout in near-surface pools and in pools located near mapped lineaments. Elevated <sup>3</sup>H occurs throughout the cave, suggesting a strong component of vapor-phase transport. Stable isotope measurements in Lechuguilla are relatively homogeneous, but vary widely in Carlsbad, showing the increased impact of evaporation in that cave.