The Geology and Management of Coyote Cave, Wind Cave National Park, South Dakota

Joel Despain
Sequoia and Kings Canyon National Parks

Abstract

Coyote Cave in Wind Cave National Park, Custer County, South Dakota, has long intrigued cavers and park managers. It exhibits strong barometric airflow implying the presence of a large cave system, but the cave passages near the entrance are very small and constricted. Recent discoveries in the cave have revealed much more cave passage and some unusual features. The cave is formed entirely in the Minnelusa Formation a Pennsylvannian-age body of rock that includes varied, thin-bedded marine sediments such as shale, sandstone, chert, and limestone. Non-carbonate rocks routinely appear in the cave walls, ceilings, and floors. Other caves in the Black Hills, including well known Jewel and Wind Caves, have formed in the more limestone-rich Mississippian-age Madison Formation. Coyote Cave appears to be structurally controlled by bedding partings and joints perpendicular to the beds. The cave has largely formed on dip in rocks that lie at an angle of 8°. The cave shows clear signs of fluvial processes, which are very rare in the caves of the Black Hills. The cave also has apparent manganese-rich deposits on its floors. Manganese is common in old (4 to 20 million years old), deeply-formed caves of the front ranges of the Rocky Mountains, such as Jewel and Lechuguilla Cave in New Mexico. But in Coyote Cave the deposits are inter-bedded with clays, a novel type of deposit. Coyote also shows clear signs of the presence of actively feeding invertebrates, including frass; worm casings; and "chewed" sticks, pine cones, and organic matter. The cave's unusual features and invertebrate wildlife will be considered in any management plan or procedures for the cave. Such procedures might include restrictions to protect the cave's many unusual features.