

Lava Beds

National Monument

National Park Service

Ice Cave Closures at Lava Beds

Why is ice found in some caves at Lava Beds National Monument?

Not all caves are created equal! Most caves in this area have some water dripping into them. Rain and snowmelt from the surface seep into the ground and enter caves through cracks in their ceilings and walls. However, some lava tube caves stay cold enough year-round to support ice.

During the winter, colder air sinks into caves. Deeper caves and multi-level tubes contain passages farther from the warming effects of the sun, and upper levels of a cave can act as insulation. Larger cave passages can retain more cold air, and caves with few or small openings to the surface can retain cold air longer. Caves with one or more of these characteristics can maintain cold enough temperatures for ice to form and stay year-round.

Why are ice caves important?

There is no surface water within Lava Beds National Monument. The ice caves provide the only permanent source of water. Local wildlife in the high desert environment must either travel great distances to the nearest lake or stream for their water, or utilize the ice caves. Many of the animals at Lava Beds have been observed using the ice caves as a water source, including birds, bats, coyotes, rabbits, bobcats, mountain lions, rodents and insects. The clarity and quality of water in the caves is important for the animals' health.

Ice caves are also important study areas. The amount of ice in a cave varies over time, depending on various environmental factors. By studying changes in ice levels, researchers can better understand the conditions that affect the cave environment.

History of Merrill and Skull Ice Caves

Both Merrill and Skull Caves are segments of the same lava tube, formed by a volcanic eruption roughly 30,000 to 40,000 years ago. It is likely local Native Americans knew of the unique features in these caves, and at times took advantage of their water sources and cooler temperatures. The first recorded discovery of the caves by non-natives was in the late 19th century. Since then, the caves have been visited by hundreds of thousands of people, who have come to marvel at the existence of ice in the midst of a desert summer, enjoy the cool interior of the caves, and to seek adventure in the darker reaches.

By 1998, over 20,000 visitors per year were entering Merrill and Skull Caves. As visitation increased, so did damage to the caves' fragile resources. Inconsiderate visitors have left graffiti on cave walls and floors, broken lava formations, thrown rocks and litter onto ice floors, and generally polluted the water of the ice pools. However, everyday visitors who mean the caves no harm have caused much of the damage.

As they walk the trails leading into the cave, visitors collect dirt and gravel on the soles of their shoes. This debris gets ground into the ice floors as visitors walk over them. By late-summer, the surfaces of the ice floors often melt. The muddy water then refreezes during winter, trapping the dirt within the ice. In both Merrill and Skull Caves, ice that once was transparent has become an opaque, muddy brown by the action of thousands of dirty shoes.

Is Merrill Cave losing its ice?

In November 1997, a strange hole appeared in Merrill Cave's largest ice floor. A gentle, cold breeze blew up from the void below. When cave researchers cautiously entered the apparent six-foot-deep hole, they found the breeze was coming from somewhere beneath the cave floor. The flowing air had worn away much of the ice under the rocky floor, leaving a 15-foot-wide chamber under the ice pool's surface. This wind erosion seemed to have been taking place for many years, and had only recently reached the surface. The exact cause of the phenomenon remains unknown.

Since the discovery of the hole, the opening has widened and considerable debris has accumulated on the remaining surface of the ice. Whether this represents natural rockfall or attempts by visitors to view or enlarge the hole is not known.

Why are parts of these caves closed?

In the spring of 1999, steel gates were installed in Merrill and Skull Caves. These temporary structures prevent access to the ice floors in both caves. This will give the ice floors a chance to recover. Monument staff will remove dirt, rocks and other debris from the ice, allowing cleaner water to collect in the ice pools. Staff will also monitor the conditions of the caves to see if the closures improve conditions in the caves. If the ice recovers, the gates can be removed with almost no trace of their presence.

In Skull Cave, the trail leading into the cave will be resurfaced with basalt lava, reducing the amount of dirt tracked in. Mesh steps with catch basins underneath will further reduce debris. The basins can be monitored and cleaned regularly. The Skull Cave ice floor can still be viewed from a platform near the edge of the pool.

At Merrill Cave, however, the widening hole in the ice presents a safety hazard. To protect the ice and determine the cause of the shrinking floor, the closure gate in Merrill was installed in the upper passage, away from the ice floor.

These cave closures, while inconvenient and unattractive, are considered necessary for the rehabilitation of the ice floors. By allowing the caves to heal themselves, we will learn more about their natural processes and be more able to properly care for these special places in the future. Thank you for your patience and understanding while the caves remain closed.