Welcome to the Big Ice Cave

An ice stalagmite in Big Ice Cave.

In Big Ice Cave, mineral features (or speleothems) such as stalagmites and stalactites are made of ice instead of minerals like calcite.

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How did this cave form?

Caves form in limestone when calcite ($CaCO_3$), which makes up the rock, is dissolved by acidic fluids. Rain water becomes naturally acidic from mixing with carbon dioxide in the atmosphere, creating carbonic acid (H_2CO_3). As the slightly acidic water percolates below the surface, limestone is dissolved to form sinkholes, cavities, and caves. Areas with evidence of solution caves are known as “karst.”

The Pryor Mountains contain the 350 million year old Madison Limestone. The upper portion of the Madison Limestone is called the Mission Canyon Member, which contains high amounts of calcite, making it ideal for forming caves.

Inside Big Ice Cave.
Walking beyond the cave platform is not recommended due to slippery footing and dangerous crevices. Cave visitors are responsible for their own safety.

Why is Ice Present?

Water drips out of fractures on the cave walls and ceiling, collecting on the cave floor to form ice speleothems. Cave temperatures depend mainly on altitude. The Big Ice Cave is 7,530 ft (2,292 m) above sea level and stays approximately 32°F (0°C) year-round. Also, the thick limestone is an excellent insulator and keeps cave temperatures generally very constant. This allows ice to stay frozen throughout the year.

Air circulation also plays a role in keeping ice in the cave. In the winter, cold dense air sinks down into the cave. In the summer, chilled air remains in the bottom of the cave because it is trapped below the warm surface air. The thickness and extent of ice varies each year depending upon how much water enters the cave.

Cave Conservation

Due to previous human impacts and vandalism many calcite crystals in Big Ice Cave have been damaged or removed. Carelessness, ignorance, and intentional vandalism, can quickly damage a cave forever and is illegal. Cave systems are extremely sensitive to human impacts. A cave takes thousands of years to form. Cave damage by humans is often irreparable within the span of human lifetimes.

Leaving the Big Ice Cave as you found it will preserve its value and beauty for future visitors.

- Do not touch, damage, or remove ice formations, rock, or calcite crystals.
- Do not write on or deface cave walls.
- Do not eat, smoke, or leave trash in the cave.

Madison Limestone Fossils

Fossil Snail Shell

Most of the fossils in the Madison Limestone are brachiopods, which are shelled marine animals that look similar to clams. Snail shell, coral, and bryozoan (sea fans) fossils are also visible. These organisms lived during the Mississippian Period (318 to 350 million years ago), when North America was closer to the equator, and much of the western part of the continent was covered by a warm, shallow sea.

Brachiopod Fossils

Bryozoan Fossils

Look for fossils on nearby rocks. Fossils indicate ancient environments and climates.

Please do not remove or damage fossils so that future generations can enjoy them.

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