



Fact Sheet Compiled in 2023

Geologic Resources Inventory Fact Sheet

The *Geologic Resources Inventory* provides geologic map data, a written report, a map poster, and pertinent information to support resource management and science-informed decision making.

Scan QR code for access to the full report, map poster, and GIS data



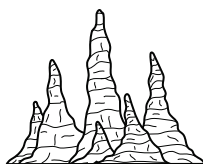
<https://irma.nps.gov/DataStore/SavedSearch/Profile/3200>

Geologic Features and Processes

Cave Features and Processes

Upper Level

- Typified by smooth scalloped walls, and many confusing, intertwining passages ending in dead-end domes. *Page 14.*



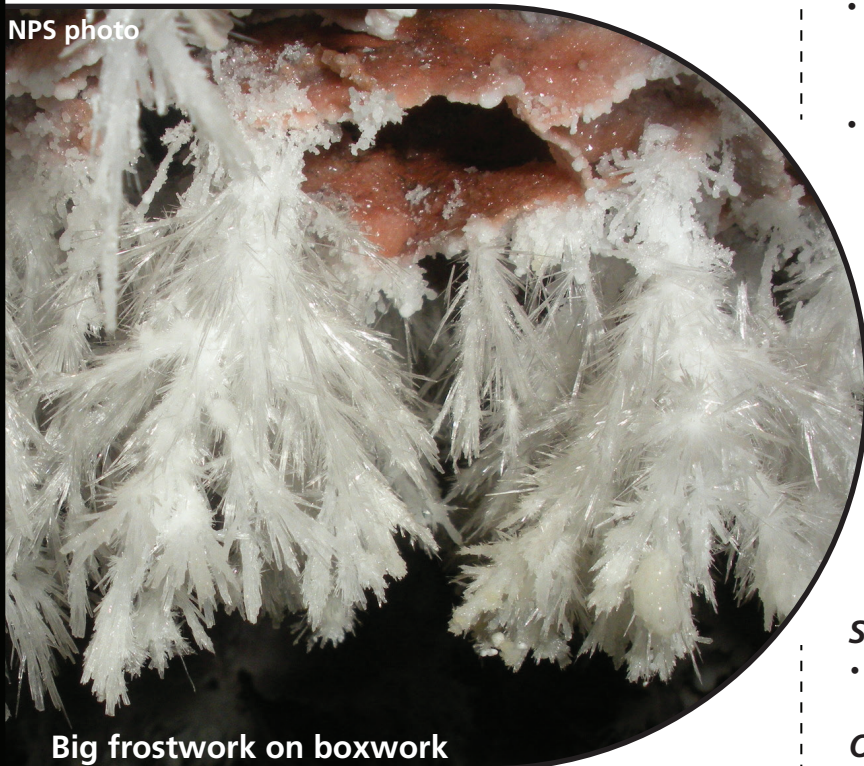
Middle Level

- Characterized by bedded limestone; wide, irregular, low-ceilinged corridors; and an abundance of boxwork and frostwork. *Page 15.*

Lower Level

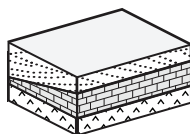
- Visually very different from the other levels; contains calcite-coated walls, false floors, and miles of canyon or fissure passages. *Page 15.*

NPS photo



Big frostwork on boxwork

The geology within Wind Cave National Park spans more than 1.7 billion years.



Speleothems and Speleogens

Boxwork

- Term first coined at Wind Cave. *Page 18.*
- Formed when any mineral is more resistant than its surrounding medium, forming a maze of “boxes.”

Helictite Bushes

- First discovered in Wind Cave.
- Form in iconic twisting, intertwining bushes that can grow to huge sizes. *Page 20.*
- Most are located along the trend of a major fracture system that runs NW/SE of the Club Room.

Frostwork

- Term first coined at Wind Cave.
- Grows from nearly every kind of rock or mineral in Wind Cave, but is most abundant where the walls are porous dolomite. *Pages 19–20.*
- Often paired with cave popcorn (see below) on boxwork.

Coralloids

- Typically rounded, can sometimes be spiky.
- Most commonly found as cave popcorn in Wind Cave. *Page 18.*

Flowstone and Draperies

- The semiarid climate of the Black Hills and the texture of the Pahasapa Limestone limit these features in the cave. *Page 19.*

Stalactites and Stalagmites

- Scarce at Wind Cave. *Page 19.*

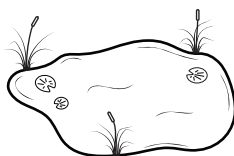
Other Speleothems and Speleogens

- Corrosion Residue, Geodes, Crystals and Coating, Moonmilk and Balloons, Rafts and False Floors, Spongework, Fibrous Speleothems and Flowers. *Pages 18–21.*



Lakes & Fluvial Features and Processes

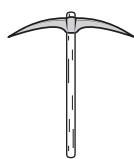
- Three perennial streams flow through Wind Cave.
- Perennial and intermittent streams lose most or all of their flow to the subsurface. *Page 9.*
- Five underground lakes exist within the cave system. *Page 15.*



Minnelusa Formation



NPS photo



Mining

- No significant mineral or energy resources are known to exist in the park. *Page 10.*
- No valid mining claims within park boundaries.

Landslides

- Road construction previously caused slumping in the Minnelusa Formation along Highway 385. *Page 9.*



Fossils

- Both the caves and bedrock host paleontological resources. *Pages 16–18.*
- Invertebrate fossils, particularly brachiopods, are fairly abundant.
- Oligocene fossil remains include rhinoceros, early horse, rabbit, Hyenodon carnivore, tortoise, and *Leptomeryx* (a deer-like animal).
- Pleistocene and Holocene vertebrate fossils exist in various caves.

Other Geologic Issues

- Airflow. *Page 6.*
- Impacts on the Cave Environment. *Pages 6–8.*
- Exploration and Inventory. *Pages 8–9.*

Geologic History

The following is a brief history of the geologic events that formed the present landscape. Pages 29–30.

Precambrian (Older than 538.8 million years ago)

- Primarily metamorphic rocks altered from their previous form during mountain building events.

Paleozoic Era (538.8 to 251.9 million years ago)

- South Dakota sits along the shoreline of an ancient sea.
- Precambrian mountains erode away.
- The Pahasapa Limestone is deposited from 360 to 340 million years ago; later dissolution at the top of the formation creates voids and sets the pattern for the main phase of cave formation (60 to 40 million years ago).
- The Minnelusa Formation is deposited on top of the Pahasapa Formation.

Mesozoic Era (251.9 to 66 million years ago)

- Thousands of feet of sediment cover the Pahasapa and Minnelusa Formations.

Cenozoic Era (66 million years ago to present)

- The Laramide Orogeny begins uplifting the Black Hills at 58 million years ago.
- Heavy erosion in the early Cenozoic (66 to 40 million years ago) erodes all rock/sediment except the Minnelusa Formation from the area above the Cave.
- As ground water moves through the now uplifting rocks, the cave is enlarged.
- Uplift continues until 5.3 million years ago as the cave drains.
- Boxwork forms before final draining.

Boxwork



NPS photo by Kim Acker