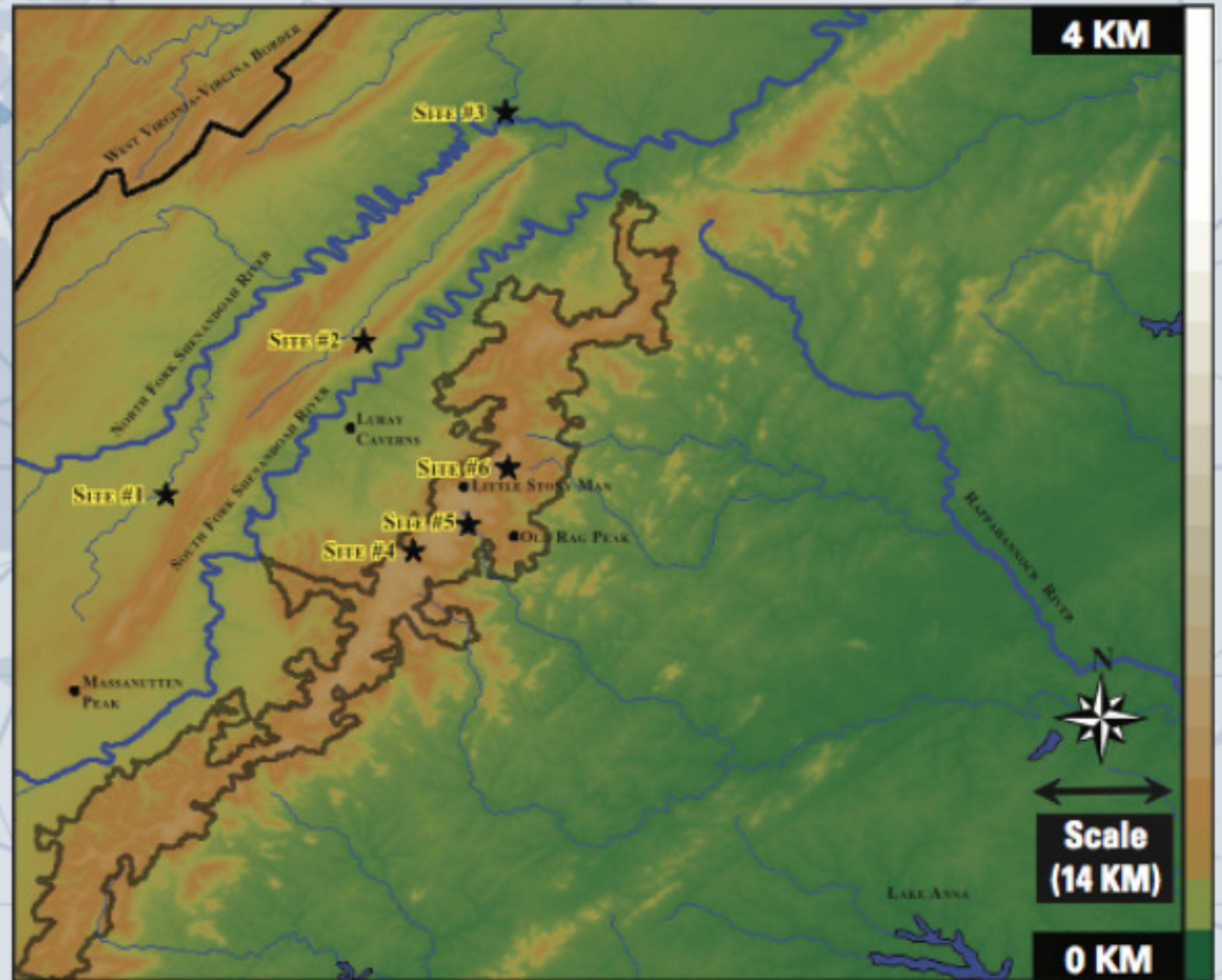


Shenandoah

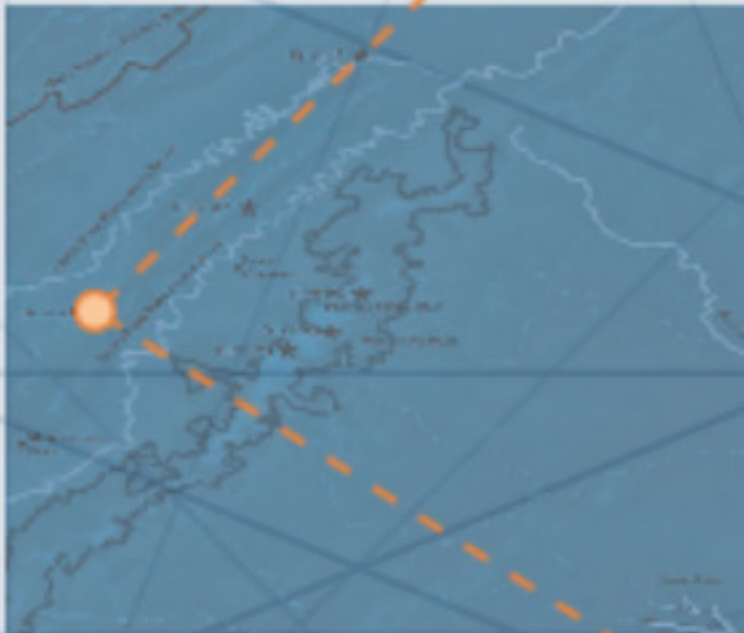
NATIONAL PARK

Elevation Map



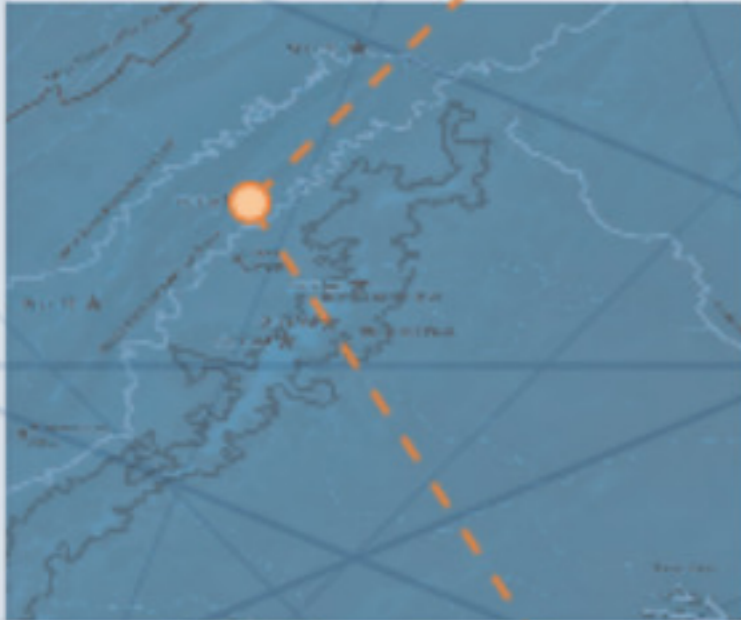
Site 1

Endless Caverns



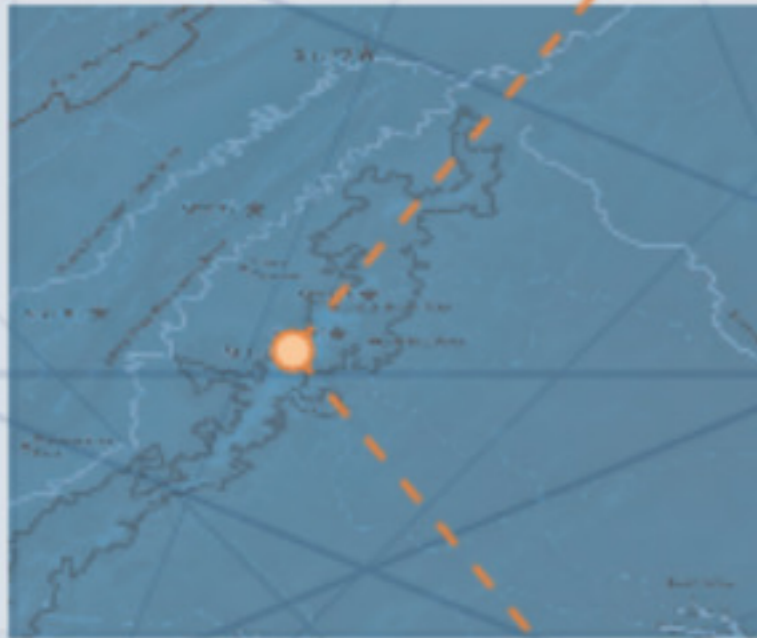
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Shenandoah River



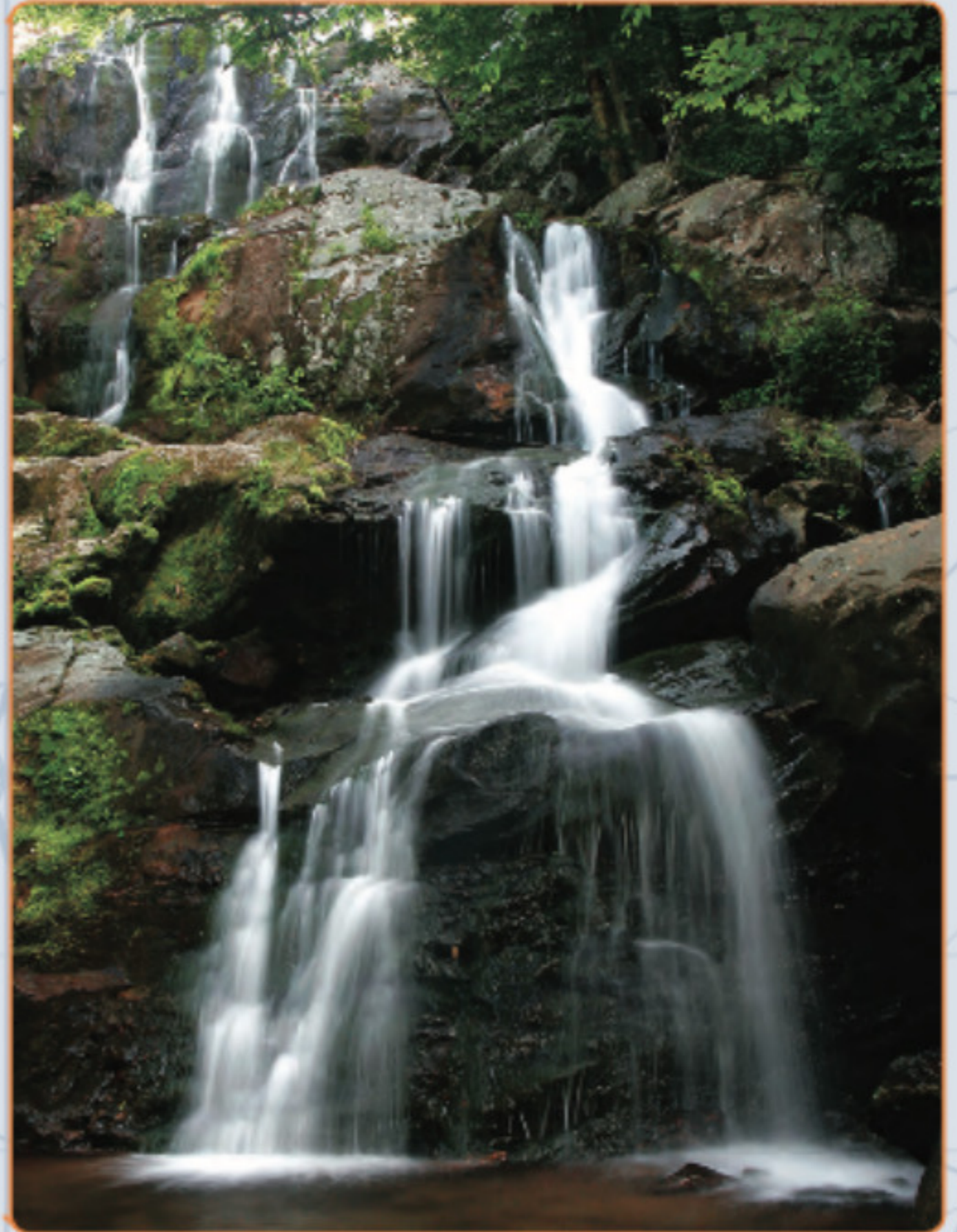
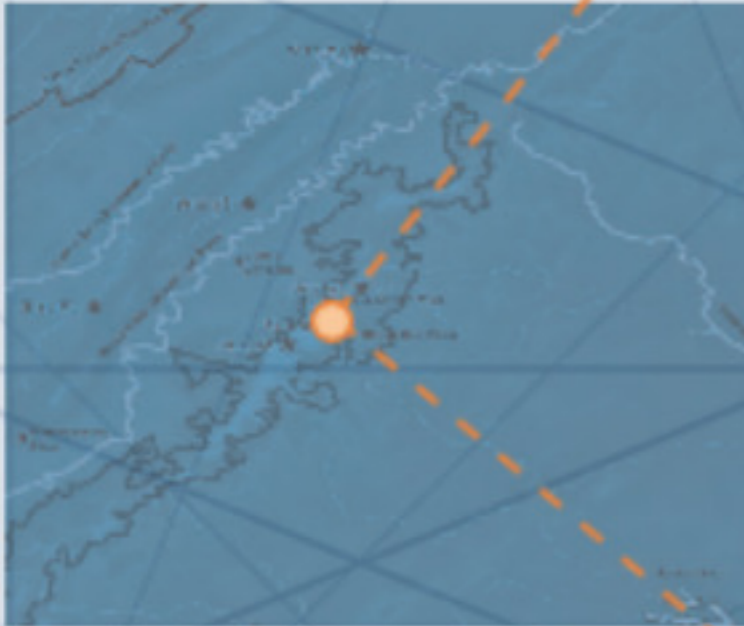
Site 4

Franklin Cliffs



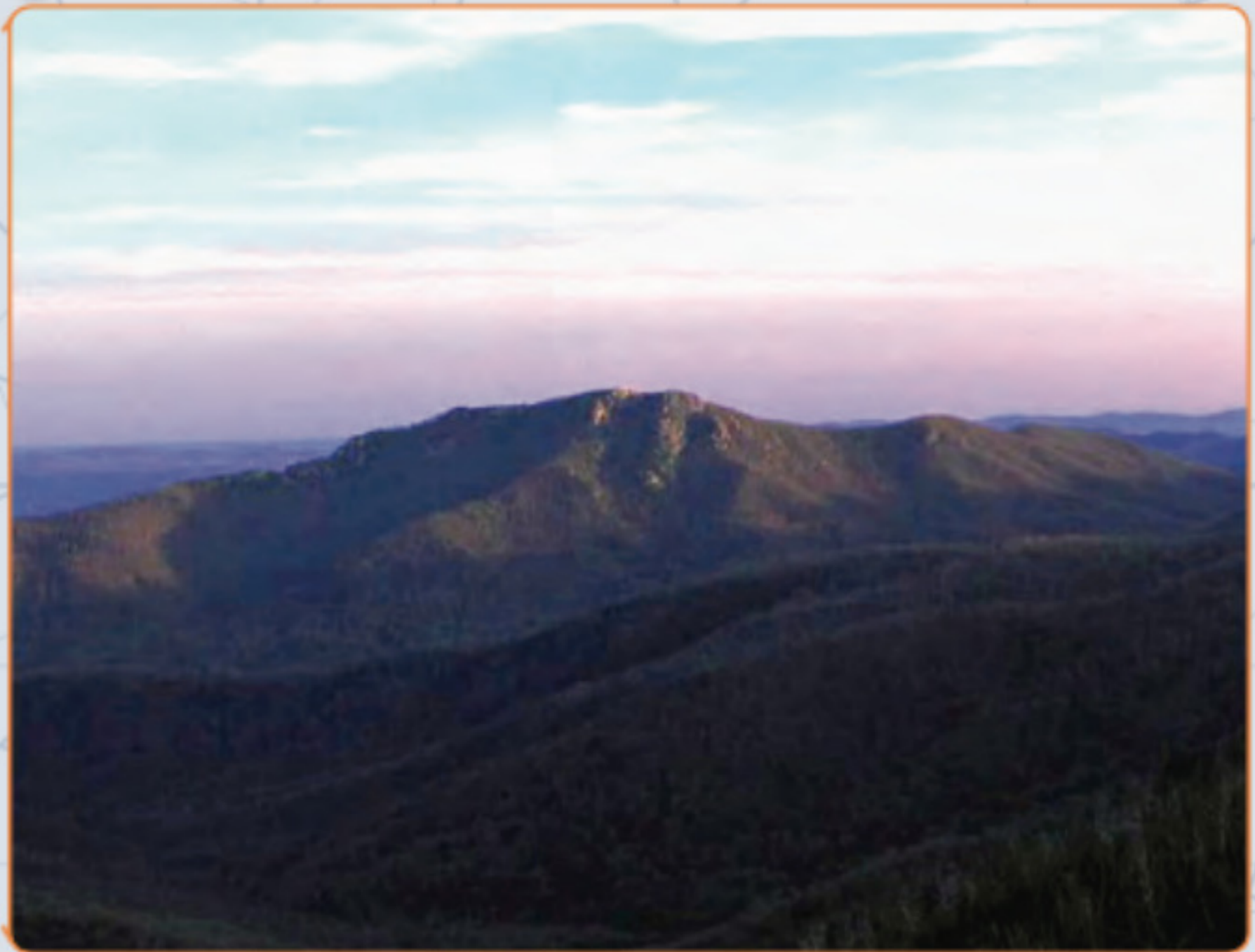
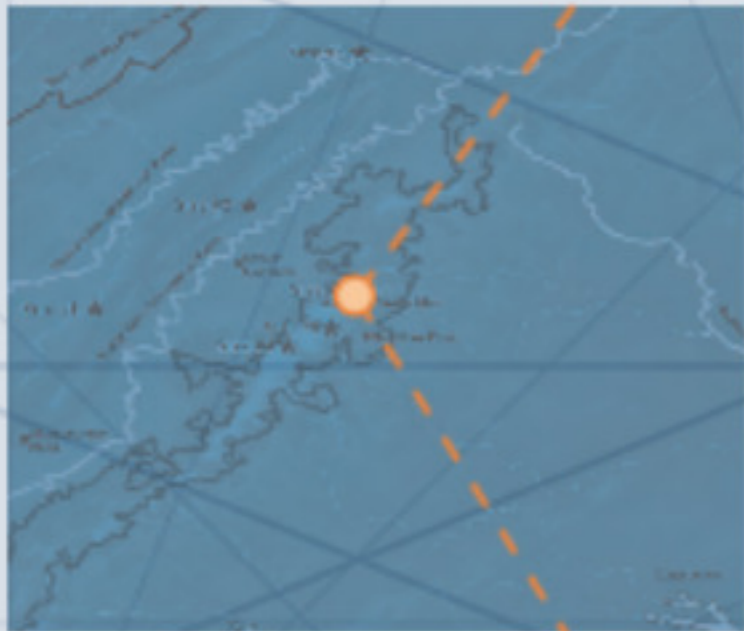
Site 5

White Oak Canyon Waterfall



Site 6

Old Rag



Water in Shenandoah National Park

Shenandoah National Park is in Virginia in the eastern part of the United States. It is in a section of the Appalachian Mountains called the Blue Ridge Mountains. These mountains got their name because of the mist that hangs over the mountains. There are many plants and trees on these mountains and these all give off water. This water in the air makes the mountains look blue from the distance.



Blue Ridge Mountains – Here you can see the mist of water that gives these mountains their name.

Climate and Atmosphere

The weather in the park is different depending on whether you are in the valley or in the mountains. Storms can hit the park anytime during the year. Rainstorms can cause large amounts of erosion by moving large sediments down rivers and streams in the park.

In the valley, winters are mild and summers are humid. In the mountains, the winters are cold and the summers are cool. The mountains get snow in the winter. Freezing temperatures followed by thawing ones cause rock to break apart. This kind of weathering is called freeze-thaw weathering.

Glaciers

There are no glaciers in the park today nor were there any during the last glaciation.

Lakes and Oceans

There are only two natural lakes in the state of Virginia and neither one of them is in Shenandoah National Park. This is because water can infiltrate the soil very easily and the rivers and streams are well connected to let water quickly flow through the area, so lakes do not form.

However, there are several man-made lakes in the area. These lakes were created for different reasons. Lake Shenandoah was created for recreation and is used for boating and fishing. The largest man-made lake in the area is Lake Anna. It was created in order to cool water from a nearby nuclear power plant. The lake is now used for boating and fishing.



Lake Anna – This lake is not very close to the mountains. There are very few lakes in the Shenandoah region. Most lakes in this region are man-made.



Mountain Streams – Streams can be very steep as this photo shows. Notice the large boulders in the stream. They probably can only be moved during times of fast flow.

Rivers and Streams

There are about 90 steep, mountain streams in the park. These streams often contain large gravel and boulders along their banks. Many of these streams have waterfalls. This occurs because the rock above the waterfall has eroded more slowly. Below the waterfall, the rock has eroded more quickly. Over time a cliff forms. When the stream reaches the cliff, it drops over the side, creating the waterfall.

There are three major rivers that flow near the park. Water that falls on the east side of the mountains flows into the James River or the Rappahannock River. The water on the west side of the mountains flows into the Shenandoah River. The water in all of these rivers eventually reaches the Chesapeake Bay. The Chesapeake Bay is a large body of water that is connected to the Atlantic Ocean.

Groundwater

Groundwater is stored mainly in the valley. Water infiltrates the rock in the valley more quickly than the rock on the nearby ridges. Groundwater erodes the material deep beneath the surface easily. This large cave was eroded by groundwater flowing beneath the surface. The material hanging from the top of the cave and coming up from the bottom has been deposited by the groundwater.



Luray Caverns – These are the largest caverns in the area. Caves are examples of erosion by groundwater. The formations pointing up and down in the cave were deposited there by dripping water.

Soil, Plants, and Animals

Thick layers of soil and a variety of plant life cover the park. Even the mountains have a lot of soil cover. The park is heavily forested. While many animals were overhunted and disappeared from the region, the park is now home to a wide variety of animals. Today, this region supports large animals such as white-tailed deer, bobcats, and black bear.

Rock in Shenandoah National Park

The Appalachian Mountains are a very old mountain range. Some of the rock in the park was formed over one billion years ago. While these mountains are no longer getting higher, it takes a long time to wear down a mountain range. Today this group of mountains may not seem as high or as big as others. However, at one time, this mountain range probably had peaks as high as Mt. Everest (the tallest mountain in the world today).

Sedimentary Rock

There are several different types of sedimentary rock in the Shenandoah area. The sedimentary rock found in the park is younger than other types of rock found in the park. It formed from the eroded material of ancient mountains. Two important types of sedimentary rock found near the park are limestone and sandstone.



Massanutten – The sandstone on this ridge is more resistant to erosion than the limestone of the valley. The sandstone shows layers from when it was deposited, but it has since been folded to form an upside down u-shape.

Limestone is what lies below the soil of the valley. The limestone deposits formed millions of years ago at the bottom of a shallow ocean. Limestone is also the rock type in which caves form at this park (see Water in Shenandoah NP).

The ridge west of the Shenandoah River is made of another type of sedimentary rock called sandstone. The sand deposits formed millions of years ago at an ocean coast.

Igneous Rock

The oldest rock in the park is igneous. In the ancient mountain range that was here before the Appalachians, granite formed deep below the surface. After hundreds of millions of years of uplift and erosion, granite now forms some of the mountains east of the main ridge inside the park. The picture on the left shows the granite on the top of Old Rag, a famous local mountain.



Old Rag – This mountain inside the park is made up of granite that is very resistant to erosion. Notice the pool of water in the hole, which was formed by standing water and weathering.

Metamorphic Rock

The rock inside the park has been compressed many times. Because of this, much of the rock is metamorphic. One kind of metamorphic rock found in the park is greenstone. Greenstone is basalt (an igneous rock) that has been metamorphosed. The ridge inside the park is mostly made up of greenstone. Greenstone can look black on the outside, but it is very green when you break it apart and look at it under a microscope. That is how it got its name.

Sedimentary rock (originally deposited in a shallow ocean next to an ancient mountain range) turned into metamorphic rock as these mountains were forming. Quartzite and slate found inside the park formed this way.

Weathering, Erosion, Deposition, and Uplift

The characteristics of the rock found in Shenandoah National Park help explain the landforms seen in the park. For instance, the valley is made up of a thick layer of limestone. This rock erodes easily. Caves form in this type of rock from flowing groundwater.

The rock types on the ridges west of the park are sandstone and are more resistant to erosion. Inside the park, the mountains and ridges are made of granite, greenstone and quartzite.



Little Stony Man – Greenstone forms many of the cliffs in the park. This one is called Little Stony Man.

These rock types erode less easily than the limestone that makes up the valley.

The photograph below shows the top of Old Rag covered by boulders. The boulders have been weathered by water and wind. They are smooth and rounded and have not been moved down the mountain. The granite that forms these boulders does not erode easily. All of the rock in the park has been uplifted many times during the formation of the mountain range. Faults and folds are common in the park and in the nearby area.



Weathering on top of Old Rag – The top of Old Rag is covered with large boulders that have been weathered by water and wind. Notice that they have not moved off the top of the mountain.