

Isle Royale

NATIONAL PARK

Elevation Map



Site 1

Grace Island



Site 2

Artwood Beach



Site 3

Siskiwit Lake



Site 4

Mount Ojibway



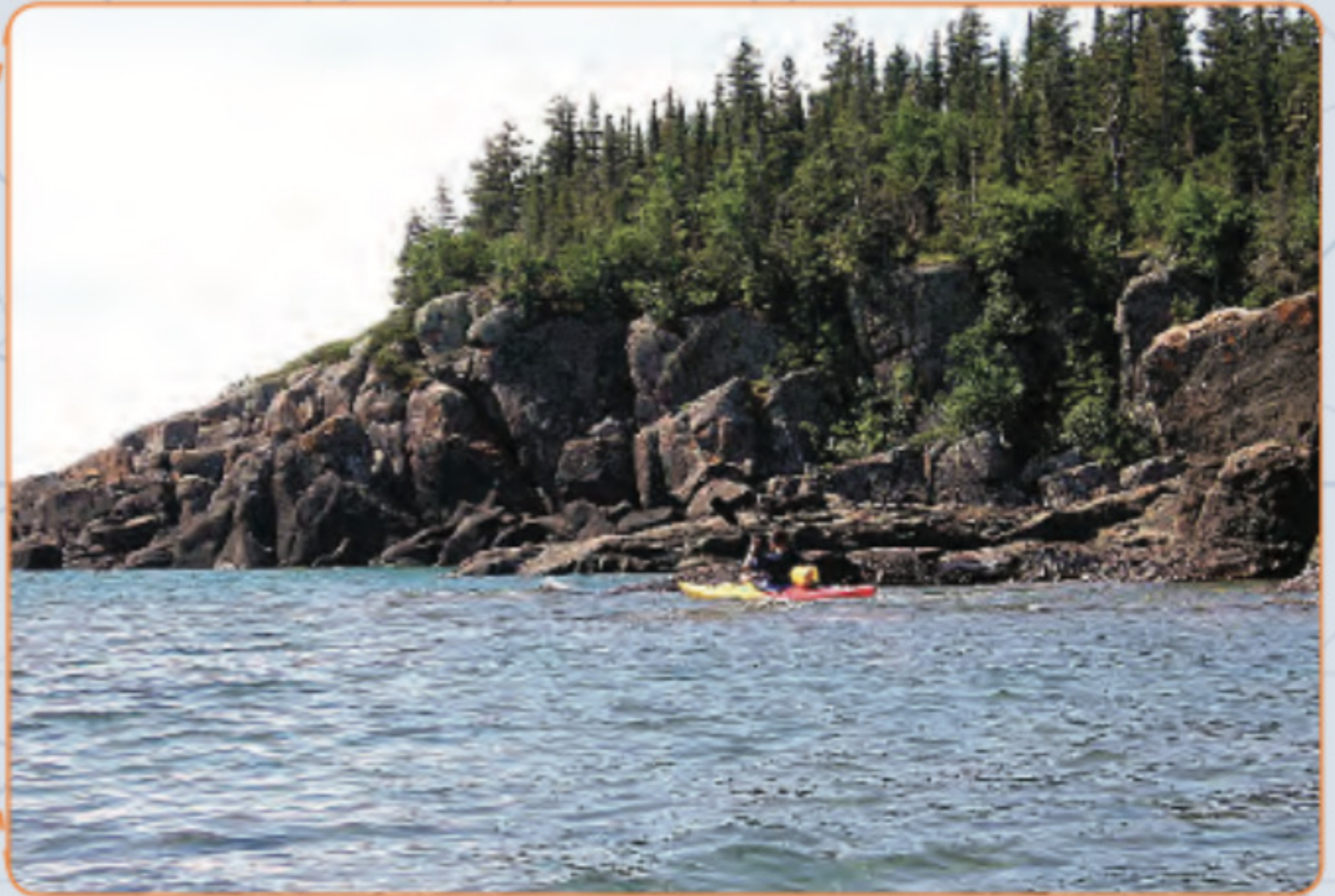
Site 5

Scoville Point



Site 6

Blake
Point



Water in Isle Royale National Park

Isle Royale National Park is in Michigan. It is located in the northern part of Lake Superior. Even though it is close to both Minnesota and Canada, it is considered part of Michigan. If you look at your park map you will see that the park is one large island surrounded by 400 smaller ones. All of these islands make up a series of ridges and valleys. However, over 80% of the park is under Lake Superior.

Climate and Atmosphere

Storms occur mostly in the summer in the park. This area receives a low to moderate amount of rainfall (50-70 cm) each year. In the winter, there is not a lot of snow in the park. For much of the winter the temperature is below freezing. Sometimes ice and snow remain on small parts of the ridges until summer. Freezing temperatures followed by thawing ones cause rock to break apart. This kind of weathering is called freeze-thaw weathering.



Land Under Water – Most of the islands have forest that covers the middle of the island. This photograph shows the parts of the island that are under water.



Ridges in the Park – The ridges are all that survived the erosional power of the glaciers. The ridges provide a rich habitat for plants and wildlife.

In the spring, the area is often covered in thick fog. Also in spring, the cycle of freezing and thawing causes weathering both along the coast of the island and in the middle of the island. On the coast, the weathered material is usually removed by falling or storm waves. In

the center of the island, material is moved downhill by flowing water caused by the summer rains. The sediment is washed into the small streams and lakes of the island.

Glaciers

There are no glaciers in the park today, but glaciers were important in shaping the landforms of the park. About 11,000 years ago, glaciers that were over 2 miles thick covered the area. The glaciers eroded the less resistant rock and formed the valleys and ridges that we see today. Glacial erosion also carved out Lake Superior. These glaciers were so huge that they removed millions of years of sediment and rock. The glaciers then deposited this material much farther south in what are now the midwestern states of Wisconsin, Illinois, and Indiana.



Waves on Lake Superior – The large waves on Lake Superior beat against the rock and erode the island.

Lakes and Oceans

There is no ocean near the park, but Lake Superior is one of the Great Lakes. There are five Great Lakes and rivers connect them to each other. Eventually, water flows out of the Great Lakes through the St. Lawrence River into the Atlantic Ocean.

Lake Superior is the largest freshwater lake in the world and Isle Royale is the largest island in the lake. Because the lake is so large, waves on Lake Superior can be very powerful. During storms, waves beat against the island and cause its sides to erode. The waves are the main cause of erosion on the island. The

action of the waves leads to interesting landforms like caves, steep cliffs, and sandy beaches. On Isle Royale there are many small ponds and lakes that form in the valleys. Lake Desor is the largest of these lakes on the island.

Rivers and Streams

The rivers and streams in the park flow parallel to the ridges and eventually empty into Lake Superior. The streams are not very steep and often do not carry a lot of sediment. Because of this they do not erode much of the land. A few of the larger streams do move enough sediment to form small deltas where they empty into Lake Superior.

Groundwater

Groundwater is the most important source of water for the small ponds, lakes and bogs within the park. Springs are where groundwater reaches the surface. Animals use some of the springs in the park for drinking water.

Soil, Plants, and Animals

Much of the rock on the island is exposed and is not covered with soil. On the northern sides of the ridges there is more exposed rock than on the southern sides. There is only a thin layer of soil and it is often sandy. The island is covered in mostly pine forest. The island is home to the grey wolf, moose and other animals. Mainly hikers and backpackers visit the island because there are no roads. Scientists use the island to study the predator-prey relationships of the animals that live there.



Lake Desor – Most of the valleys are filled up with water like here at Lake Desor. Flowing streams and groundwater keep the inland lakes full.

Rock in Isle Royale National Park

The rock of Isle Royale formed 800 million years before Lake Superior formed. The rock that makes up the islands formed at the surface over a billion years ago when a giant line of volcanic eruptions caused lava to flow from Kansas to Michigan.

Sedimentary Rock

There are two types of sedimentary rock found on the island. The first is sedimentary rock that is found between the lava flows. There were many volcanic eruptions, but there were also times when the eruptions stopped. After the lava cooled, sediment was deposited on top of the volcanic rock. These sedimentary rocks are not very resistant to erosion, so they are not often seen at the surface. However, it is this rock that lies below the soil in the valleys.

The other type of sedimentary rock is the Copper Harbor Conglomerate. It is a unique type of sedimentary rock. It formed after the volcanoes stopped erupting for good, and it forms the southern ridge of the island. Conglomerates are similar to other sedimentary rock except that instead of being made

up of only sand or clay, they are made up of large gravels or even boulders. In the picture, you can see the large pebbles that make up this rock. This makes this type of rock more resistant to erosion than other types of sedimentary rock. This red to brown rock is easily found on the island.



Copper Harbor Conglomerate – The large sediments that make up this rock make it resistant to erosion. Notice how big the pebbles can be.



Basalt Ridge – The boulders on this ridge are made up of basalt. Most of the ridges and cliffs in the park are made of igneous rock that is very resistant to erosion.

Igneous Rock

Most of the rock in the park is igneous. Volcanic eruptions were common in this area over a billion years ago. The rock is much like the basalt that is found in Hawaii. Both formed from lava flowing at the surface. Most of the ridges on Isle Royale are made up of these different sheets of basalt. This type of rock is very resistant to erosion.

The layers of basalt are tilted. You can see this in the picture below. This happened as the lava cooled and shrank to form a large bowl-shaped basin. As the basin cooled, the rock tilted towards the center of the basin. The rock in this area has also experienced uplift. After the two miles of ice that covered the region were gone, large faults were created. The island rose higher over time because of uplift.

There are other kinds of igneous rock deep below the surface, like granite. However, this type of rock is not seen at the surface on the island.



Tilted Basalt –The flat surfaces on this island are the top of different basalt layers. See how they gradually tilt into the lake.

Metamorphic Rock

There is no metamorphic rock that can be seen on the island. However, deep below the surface there are metamorphic rocks like gneiss and greenstone.

Weathering, Erosion, Deposition, and Uplift

Many of the landforms of Isle Royale can be explained by looking at the type of rock that is found in different places. The valleys are formed where layers of sedimentary rock have been easily eroded. The rock that makes up the ridges is more resistant to erosion. For most of the park, the rock on the ridges is basalt that formed from ancient lava flows. However, the Copper Harbor Conglomerate also makes up ridges in the southern part of the main island.

Erosion does not happen very quickly in the middle of the island. Most erosion happens on the sides of the island due to the strong waves of Lake Superior. The northern shores are often made up of cliffs and the southern shores are often made up of beaches. Over time, erosion causes the size of the islands to shrink. Faults and the presence of sedimentary rock at the surface show that this area has been uplifted. Below are the Palisades, cliffs that formed on the northern side of the ridges. The cliffs form because the basalt layers are tilted towards the south. The columns you see are formed as the lava cooled into rock.

