

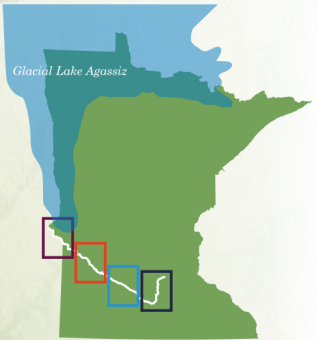
# A River's Legacy: ICE, ROCK AND WATER

Explore places that tell the story of melting ice, ancient rock, and the power of water to shape the landscape.

The dramatic story of the Minnesota River valley began about 13,000 years ago as the ice sheet of the last glaciers receded northward. The meltwater from the ice pooled to form Glacial Lake Agassiz. The lake grew so expansive that it overflowed in a torrent of water known as Glacial River Warren. The force of the escaping floodwaters excavated millions of tons of earth and uncovered ancient bedrock outcrops of granite and gneiss (pronounced 'nice'). Today, the Minnesota River slowly winds its way through the gorge carved by the monstrous ancient river.

## FOR MORE INFORMATION

Geological Society of Minnesota  
[gsmn.org](http://gsmn.org)  
 Minnesota River Basin Data Center,  
 Minnesota State University, Mankato  
[mrbdc.mnsu.edu](http://mrbdc.mnsu.edu)  
*Roadside Geology of Minnesota* by  
 Richard W. Ojakangas. 2009.  
 Mountain Press Publishing Company,  
 Missoula, Montana.

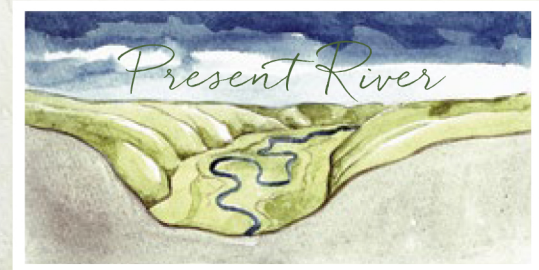
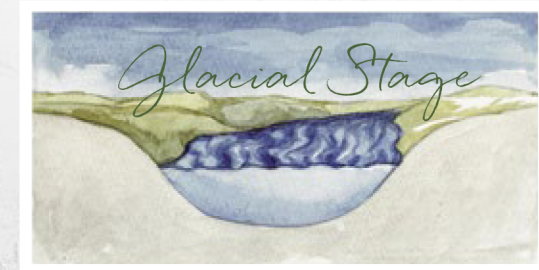


## Granite Falls Area *A Witness to Time*

Between Montevideo and Granite Falls, the Byway passes through the lakebed of a glacial meltwater lake older than Lake Agassiz. You can experience the flatness and dark soils of the **Glacial Lake Benson [4]** lakebed along County Road 15 to the west of the **Swensson Farm Museum**. Near Granite Falls are impressive bedrock outcrops dated to 3.6 billion years making it the oldest rock in Minnesota and among the oldest exposed bedrock in the world. Look at the **Yellow Medicine County Historical Society** for a large bedrock outcrop and a Byway interpretive marker. Nearby **Blue Devil Valley [6]** and **Gneiss Outcrops [7]** Scientific and Natural Areas offer the opportunity to walk among the outcrops but be mindful that SNAs do not have trails or other amenities and have been set aside to protect rare and sensitive natural resources. For one of the best views of the expanse of the valley carved by glacial River Warren, stop at the **Minnesota River Valley Overlook [5]** where you will also find a Geological Society of Minnesota marker.

**Big Stone Lake Area**  
*Where the River Gets its Start*

The **Continental Divide [1]** is a remnant of the ridge that once held back Lake Agassiz until the lake grew so large and deep that it broke through about 12,000 years ago. For a view of the impressive valley carved by the outflow of River Warren head up the bluff to the **Big Stone County Museum [2]**. At the overlook you will find a Byway marker and a Geological Society of Minnesota marker illustrating the story of River Warren and the geology of the Ortonville Region. To see massive outcrops of ancient granite worn smooth by glacial waters visit the **Big Stone National Wildlife Refuge [3]** Granite Outcrop loop trail (partially paved) or drive the auto tour route through the refuge.



## Redwood Falls Area *Ancient Outcrops*

An impressive exposure of 3.6-billion-year-old Morton Gneiss is preserved within the **Morton Outcrops Scientific and Natural Area [9]**. A careful walk up the bluff will yield an exceptional view of the river valley. Look too for circular potholes ground into the solid bedrock by pebbles or sediment caught in circular currents within the turbulent glacial river. The Redwood Falls area also tells a story of geological change. During the late Cretaceous period, about 100 to 80 million years ago, a warm tropical climate eroded the upper layers of the gneiss. The effects of this process can be seen in **Čanšayapi / Ramsey Park [8]** in Redwood Falls. The gneiss mostly broke down into white kaolin clays that can be seen in in bank of the Redwood River near the lower park shelter where the Geological Society of Minnesota has placed a marker. Exposures of white clay can also be seen in the banks of **Fort Ridgely Creek** within **Fort Ridgely State Park [10]** and at other points along the river valley.

## Mankato Area *Mystery of the Big Bend*

The reason for the dramatic bend in the Minnesota River is a geological mystery. One theory is that layers of bedrock blocked Glacial River Warren's eastward path and turned it north. Another theory is that the river encountered a buried ancient river channel and followed it north. Perhaps it was a combination of both the resistant bedrock and an easier path offered by the old valley that created the bend. For a water's edge view of the river flowing around the big bend visit **Riverfront Park [13]**. Another point of view from further up the bluff can be found at **Lookout Drive Scenic Overlook [12]** where the Geological Society of Minnesota placed a Mankato Region geology marker. Another geological story is told at nearby **Minneopa State Park**. The park's bison enclosure is on an old terrace across which River Warren once flowed. This flat prairie is scattered with large, rounded boulders called glacial erratics that were carried and pushed into the area by glaciers about 14,000 years ago. The prairie scattered with stones and an impressive view of the wide river valley can be seen from the **Seppman Mill Overlook [11]**.

## Waterfalls OF THE MINNESOTA RIVER VALLEY

Several waterfalls are present along the Minnesota River where tributary streams tumble over bedrock shelves on their way to the river. Among them are the double falls of **Minneopa Falls [A]**; the deep drop of **Minnemishinona Falls [B]**, and picturesque **Ramsey Falls [C]**. The waterfall that lent **Granite Falls [D]** its name has since been covered by a hydropower dam, but the cascading water is still a sight to see.



FOR MORE BYWAY INFORMATION, VISIT [www.mnrivervalley.com](http://www.mnrivervalley.com) OR CALL 1-888-463-9856

