

Wisconsin and Minnesota

**Geologic Resources Inventory
Natural Resource Stewardship and Science**



North



0 5 Kilometers

0 5 Miles



Photo Location

Geologic Contacts

— Known or certain
 - - - - - Inferred or approximate
 — Quadrangle boundary

Roads

- Major road
-  St. Croix Scenic Byway
- Highway
-  Small or local road

Glacial Features

>>>>	Esker
^	Direction of glacial stream flow
T	Moraine ridge
→	Trend of glacial striations
→	Generalized direction of glacial melt-water drainage
—	Dune crest
.....	Glacial linear feature
	Channel
— — — — —	Escarpment, river cutbank, or terrace margin, line dashed where approximate

Geologic Units

	Water
Qf	Alluvial fan deposit (Holocene)
Qm	Marl (Holocene)
Qws	Windblown sand (Holocene)
Qhc	Steep-slope and slope deposits (Holocene)
Qpgs	Postglacial sand and silt (Holocene)
Qsp	Postglacial stream sediment (Holocene)
Qa	Gravelly sand, clay, and silt (Holocene and late Pleistocene)
Qfg	Gravelly sand (Holocene and late Pleistocene)
Qp	Peat and muck (Holocene and late Pleistocene)
Ol	Silt, clay, and sand (Holocene and late Pleistocene)
Qst	Terraces (Pleistocene)
Qna	New Ulm Formation, sandy till (late Pleistocene)
Qnm	New Ulm Formation, loamy till (moderate-relief) (late Pleistocene)
Qni	New Ulm Formation, ice-contact stratified deposit (late Pleistocene)
Qnd	New Ulm Formation, Twin Cities Member (late Pleistocene)
Qno	New Ulm Formation, Twin Cities Member, fine-grained sand and gravelly sand (late Pleistocene)
Qnl	New Ulm Formation, Twin Cities Member, fine-grained sand, silt, and clay (late Pleistocene)
Qnt	New Ulm Formation, Twin Cities Member, diamicton (late Pleistocene)
Qsto	Trade River Formation, Oseola beach (Pleistocene)
Qpli	Trade River Formation, ice-dammed-lake plains (Pleistocene)
Qstv	Trade River Formation, stream sediment (Pleistocene)
Qplm	Trade River Formation, moraine ridges (Pleistocene)
Qgr	Trade River Formation, glacial sediment (Pleistocene)
Qbc	New Brighton Formation, silt and clay facies (Pleistocene)
Qbs	New Brighton Formation, sand facies (Pleistocene)
Qby	New Brighton Formation, sand and gravel facies (Pleistocene)
Qwr	West Campus Formation, Richfield terrace (Pleistocene)
Qwl	West Campus Formation, Langdon terrace (Pleistocene)
Qwg	West Campus Formation, Grey Cloud terrace (Pleistocene)
Qwsm	West Campus Formation, St. Mary's terrace (Pleistocene)
Qcfsi	Copper Falls Formation, silt and sand (Pleistocene)
Qcfsb	Copper Falls Formation, sand and gravel in outwash deposits, steep hill slopes in areas of deeply dissected drainage (Pleistocene)
Qcfsd	Copper Falls Formation, sand and gravel in outwash deposits, more than 50 percent collapsed surface (Pleistocene)
Qcfspp	Copper Falls Formation, sand and gravel in outwash deposits, 20 to 50 percent collapsed surface (Pleistocene)
Qcfsn	Copper Falls Formation, sand and gravel in outwash deposits, less than 20 percent collapsed surface (Pleistocene)
Qcfd	Copper Falls Formation, diamicton (Pleistocene)
Qau	Copper Falls Formation, uncapped meltwater stream sediment (Pleistocene)
Qosi	Copper Falls Formation, Sylvan Lake Member, offshore deposits (Pleistocene)
Qnsi	Copper Falls Formation, Sylvan Lake Member, nearshore deposits (Pleistocene)
Qush	Copper Falls Formation, Sylvan Lake Member, hummocky topography underlain by till (Pleistocene)
Qusn	Copper Falls Formation, Sylvan Lake Member, flat to low-relief-hummocky landscape (Pleistocene)
Qssv	Copper Falls Formation, Sylvan Lake Member, valleys (Pleistocene)
Qshh	Copper Falls Formation, Sylvan Lake Member, hummocks deposited by meltwater from the Superior Lobe (Pleistocene)
Qssp	Copper Falls Formation, Sylvan Lake Member, pitted outwash plains (Pleistocene)
Qgs	Copper Falls Formation, Sylvan Lake Member, glacial sediment (Pleistocene)
Qcd	Cromwell Formation, subglacial till (Pleistocene)
Qct	Cromwell Formation, diamicton (late Pleistocene)
Qds	Cromwell Formation, till, sand, and gravel (Pleistocene)
Qcc	Cromwell Formation, lake clay and silt (Pleistocene)
Qco	Cromwell Formation, sand to gravel (late Pleistocene)
Qcl	Cromwell Formation, fine-grained sand, silt, and clay (late Pleistocene)
Qci	Cromwell Formation, ice-contact stratified deposit (Pleistocene)
Qpc	Prairie du Chien Group (Ordovician)
Qclb	Bedrock, undivided (Ordovician and Cambrian)
Qcp	Bedrock outcrop (Ordovician and Cambrian)
OCu	Bedrock at or near the surface (Ordovician and Cambrian)
Pzr	Undefined Paleozoic rock (Paleozoic)
PCc	Outcrops of Precambrian basal of the Chengwatana Group (Precambrian)
Phmc	Clam Falls volcanics (Middle Proterozoic)

This map displays geologic map data compiled by the National Park Service Geologic Resources Inventory. It is not a substitute for site-specific investigations. All GRI products are available at <https://go.nps.gov/gripubs>.

Source Maps:

Bauer, E. J., V. W. Chapp, J. R. Steenberg, A. J. Retzlaff, V. L. Stanley, G. N. Meyer, and R. S. Lively. 2016. *Geologic Atlas of Washington County, Minnesota: Minnesota Geological Survey, County Atlas Series C-39 Part A (Plates 3, 4, 6), scale 1:100,000.*

Carson, E., Rawling, J.E., III, and Rose, C. 2017. *Quaternary Geologic Map of Portions of the St. Croix National Scenic Riverway, Wisconsin: Wisconsin Geological and Natural History Survey, unpublished digital data, scale 1:100,000.*

Johnson, M.D. 2000. *Pleistocene Geology of Polk County, Wisconsin: Wisconsin Geological and Natural History Survey, Bulletin 92, scale 1:100,000.*

Kostka, S.J., Hinkle, H.J., Michelson, D.M., and Baker, R.W. 2004. *Preliminary Quaternary Geologic Map for St. Croix National Scenic Riverway, Wisconsin Geological and Natural History Survey, Open-File Report 2004-22, scale 1:100,000.*

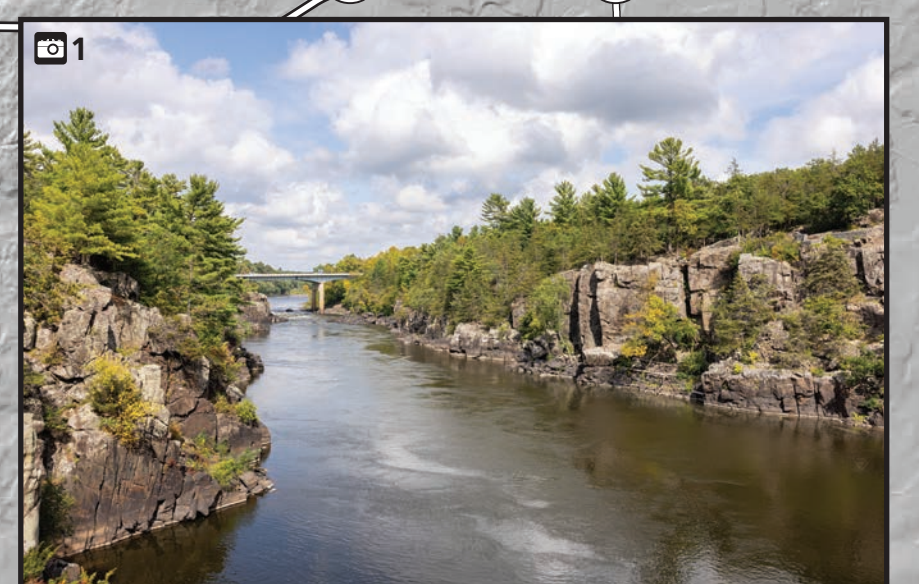
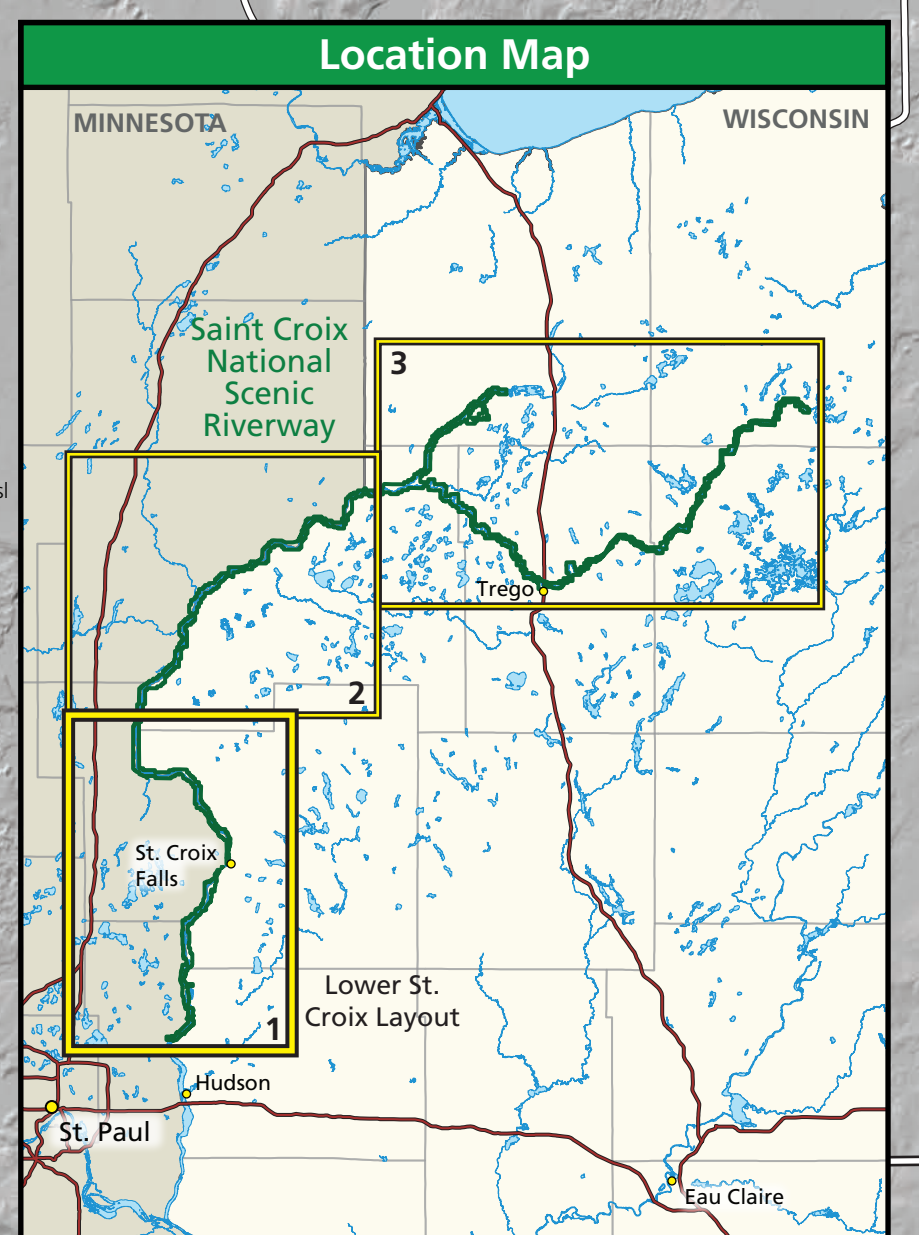
National Park Service Water Resources Division. 2000. *Saint Croix National Scenic River Small-scale Base GIS Data: National Park Service, scale 1:100,000.*

Setterholm, Dale R. 2010. *Geologic Atlas of Chisago County, Minnesota: Minnesota Geological Survey, County Atlas Series C-22 Part A (Plates 1, 3, 4, 6), scale 1:100,000.*

Source Scale: 1:100,000. According to US National Map Accuracy Standards, features are within 50.8 m (166 ft) of their true location.

Poster Layout: Matt Harrington (Colorado State University)

Poster Date: March 2026



Near the close of the last Ice Age (around 10,000 to 12,000 years ago), massive outbursts of water from Glacial Lake Duluth raged down the St. Croix river valley, carving and incising into 1.1 billion-year-old volcanic rock, forming the Dalles of the St. Croix. Evidence of past glaciations can still be seen at the Dalles in the forms of glacial potholes and striations. Photo by Matt Harrington. September 2025.