Quaternary Geology of Vernon County, Wisconsin

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MAP 513
2025

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Symbols

Geologic contact—concealed contacts between loess units are not shown

Joint or fault—adapted from Clayton (1989)[1]

Terrace scarp—symbols point downslope

St. Peter scarp—symbols point downslope

Vertical face of the Wonewoc Formation

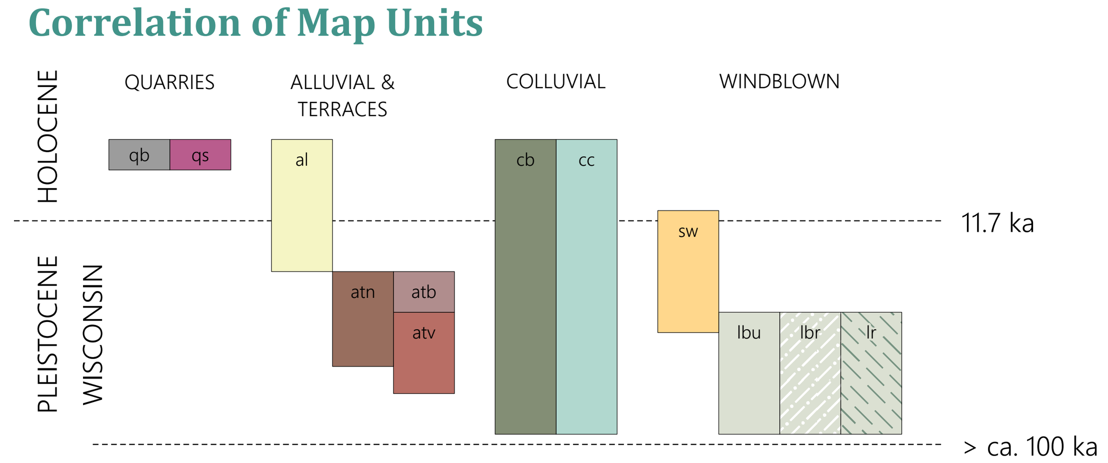
Valley edge—edge of major river valleys outside of map area

Ho-Chunk Nation trust lands 2024

County boundaries: Wisconsin Department of Natural Resources 2011 and Iowa Department of Natural Resources 2020. Transportation: adapted from US Census Bureau 2015. Major lakes and streams: adapted from the National Hydrography Dataset 2022. Terrain shading by WGNHS 2022 with lidar elevation data from Vernon County, Wisconsin 2010. Trust lands provided by Ho-Chunk Nation 2024.

[1]Clayton, L., 1989, Geology of Juneau County, Wisconsin: Wisconsin Geological and Natural History Survey Information Circular 66, 16 p., 2 pls., scale 1:100,000, https://doi.org/10.54915/pbhz3607.

Correlation of Map Units



Scale 1:100,000

MILES 1 0 1 2 3 4 5

KILOMETERS 1 0 1 2 3 4 5 6 7 8

Wisconsin Transverse Mercator Projection, 1991 adjustment to the North American Datum of 1983 (NAD 83/91).

Explanation

Alluvial

al — Alluvium (al). Primarily sand or slightly gravelly sand on modern valley bottoms, most deposited during the last part of the Holocene. Overlain by thin peat and thin silty overbank sediment in many places.

Terraces

atb — Sediment of the Bagley terrace (atb). Sand or gravelly sand, at least a few meters thick to more than 50 m thick along the Mississippi River valley, deposited by streams carrying meltwater from the margins of the Laurentide Ice Sheet during the late Wisconsin Glaciation. Surface often exhibits erosional features and is presumed to have formed by erosion of a higher, older depositional surface. Occurs as terraces about 7–10 m above modern floodplain elevation in the mainstem valley, formed by downcutting during the latest Pleistocene and Holocene.

atn — Non-glacial alluvial terrace sediment (atn). Moderately well to well sorted sand, at least a few meters thick to more than 25 m thick, deposited along streams in nonglaciated drainage basins carrying locally derived sediment sourced from erosion of Cambrian sandstone during the late Wisconsin Glaciation. Occurs as terraces formed by downcutting during the latest Pleistocene and Holocene.

atv — Sediment of the Savanna terrace (atv). Laminated silt and clay and lenses of moderately well to well sorted sand, overlain by either 10 m or more of laminated red and gray clays or by 10 m or more of massive windblown silt. Total sedimentary package is as much as 50 m thick, deposited in the mouths of tributaries to the Mississippi River. Deposited in slackwater lacustrine settings caused by aggradation of sand and gravelly sand on the adjacent mainstem Mississippi River during the late Wisconsin Glaciation. Occurs as terraces about 15–20 m above modern tributary floodplain elevation, formed by downcutting during the latest Pleistocene and Holocene.

Colluvial

cb — Fine-grained silty colluvium on Paleozoic bedrock (cb). Windblown silt, typically more than 3 m thick and locally as much as 10 m thick. Noncalcareous and massive. Primarily composed of the Peoria Member of the Kieler Formation. Occurs on sloped surfaces, and is moving downslope due to gravity; can form thick lobes and fans at the toes of slopes. Almost exclusively found on bedrock surfaces formed by sandstones of the Lone Rock Formation of the Tunnel City Group or on various residual products derived from the Readstown Member of the St. Peter Sandstone.

cc — Coarse-grained colluvium (cc). Unsorted slope sediment derived from localized erosion of Paleozoic bedrock and from windblown silt and residuum from upland surfaces moving downslope due to gravity. Most commonly associated with steep slopes immediately underlain by resistant Paleozoic dolomites and sandstones. Bedrock blocks can be larger than 2 m in diameter. Total thickness often 0–2 m, but can be as thick as 20 m in basal hillslope positions. Alternatively described as the colluvial phase of the Kieler Formation.

Windblown

sw — Windblown sand (sw). Well sorted fine to medium sand, more than about 1.5 m thick. Dunes are generally no more than a few meters high.

lbr — Loess on Paleozoic bedrock, Readstown Member (lbr). Windblown silt, typically more than 1.5 m thick, generally thickest near the Mississippi River and thinning toward the east. Noncalcareous and massive. Shows evidence of soil formation. Primarily composed of the Peoria Member of the Kieler Formation, although the underlying Roxana and Loveland members can be found locally in core samples. Found on bedrock surfaces formed by the Readstown Member of the St. Peter Formation, and accompanied by a characteristic surface morphology likely resulting from weathering of this bedrock unit. In core samples, the Readstown Member appears as mixed white, yellow, and orange sands with white, pale yellow, pale green, orange, red, and black clays.

lbu — Loess on Paleozoic bedrock, undifferentiated (lbu). Windblown silt, typically more than 1.5 m thick, generally thickest near the Mississippi River and thinning toward the east. Noncalcareous and massive. Shows evidence of soil formation. Primarily composed of the Peoria Member of the Kieler Formation, although the underlying Roxana and Loveland members can be found locally in core samples. Generally found on bedrock surfaces formed by sandstone of the Tonti Member of the St. Peter Formation or by various dolomites of the Sinnipee Group, but may also occur on bedrock surfaces formed by sandstone and shale of the Readstown Member of the St. Peter Formation or by dolomite of the Prairie du Chien Group.

lr — Loess on residuum (lr). Windblown silt, typically more than 1.5 m thick, generally thickest near the Mississippi River and thinning toward the east. Noncalcareous and massive. Shows evidence of soil formation. Primarily composed of the Peoria Member of the Kieler Formation, although the underlying Roxana and Loveland members can be found locally in core samples. Found on residual clays of the Rountree Formation, which is derived from weathering of dolomites from underlying Sinnipee Group or Prairie du Chien Group. In core samples, the Rountree Formation appears as orange to red clay with common white to light gray chert fragments.

Quarries

qb — Bedrock quarries (qb). Modern industrial excavations for dolomite or sandstone. Associated with various resistant Paleozoic bedrock units.

qs — Sand and gravel quarries (qs). Modern industrial excavations for sand or sand and gravel. Exclusively associated with sandy alluvial or terrace deposits or windblown sand deposits.