

MAP UNITS

CENOZOIC

QUATERNARY

Quaternary units are mapped where thicknesses are estimated to exceed 10 ft (3 m). Quaternary unit descriptions are modified slightly from Stewart and others (2022).

Alluvium

Qa – Alluvium. Sand, silt, and mud. Well-sorted, Holocene to Pleistocene. Deposited as overbank deposits in modern valleys. **Qal** – Silt, clay, and very fine sand. Well-sorted, and largely composed of Holocene fluviatile reworked loess deposits found on gently inclined stream channels on upland plateaus. **Qbu** – Sand, silt, and mud slackwater terrace deposits. Well-sorted. Typically 3.3–10 ft (1–3 m) above Qa deposits. **Qcl** – Cobbles, sand and silt deposited in poorly sorted alluvial fan deposits where steep streams merge with flat-bottomed valleys.

Colluvium

Qc – Colluvium. Boulders, cobbles, sand, and silt. Angular, and poorly sorted. Deposited near the bottom of valley slopes from gravity-driven processes, including mass wasting, soil creep, and non-channelized overland flow.

Windblown sediment

Qv – Very fine sand, silt, and clay deposited from windblown processes during the late Pleistocene. May include parts of the Rosara and Plover Members of the Kellee Formation. **Qk** – Undivided loess over dominantly carbonate bedrock. Clay-rich residuum of the Roundtree formation (on Galena, Decorah, and Platteville Formations) or Readstown member (on Prairie du Chien Group) is discontinuous at the bedrock surface underlying this unit. **Qd** – Undivided loess over mostly sandstone bedrock. **Ql** – Undivided loess over carbonate and sandstone bedrock. Overlies discontinuous residuum where deposited on carbonate.

PALEOZOIC

Bedrock units were mapped when the depth-to-bedrock was estimated to be less than 10 ft (3 m). Stratigraphic names used follow Agnew and others (1956). This differs from the divisions of the Synscope Group in Wisconsin Geological and Natural History Survey (2011). For detailed unit descriptions and more information about the bedrock geology of the Highland quadrangles please see the supplemental report that accompanies this map at: <https://doi.org/10.54915/nqf2637>.

ORDOVICIAN

Galena Formation

Og – **Galena Formation:** Full unroofed thickness is 220–230 ft (67–70 m), maximum of ~100 ft (30 m) preserved. Thick-bedded, gray and tan, cherty, fine- to coarse-grained silty crystalline dolomite. Majority of formation affected by *Holostrophia* burrow networks which form characteristic honeycomb weathering pattern.

Decorah Formation

Od – **Decorah Formation:** 30–40 ft (9–12 m) thick.
— **Iron Member:** 20–25 ft (6–7.6 m) thick. Medium bedded, gray, shaly, fine to medium-grained limestone and dolomite. Contains abundant gray to green shale partings especially in lower part of member.
— **Guttenberg Member:** 9–16 ft (2.5–5 m) thick. Thin-bedded, light-brown, fine-grained fossiliferous limestone with abundant interbedded tan brown shale.
— **Spencer Ferry Member:** 2–6 ft (0.5–1.5 m) thick. Thin-bedded bluish green and olive green shale with lesser limestone interbeds.

Platteville Formation

Op – **Platteville Formation:** 45–55 ft (14–17 m) thick.
— **Quimby's Mill Member:** 3–6 ft (1–2 m) thick. Thin- to medium-bedded, light purplish gray to tan, very hard and dense, fine-grained, moderately fossiliferous limestone separated by tan shale beds.
— **McGregor Member:** 25–30 ft (7.6–10.6 m) thick. Thin- to medium- wavy-bedded, light gray, very fossiliferous fine-grained limestone and dolomite with abundant tan- or medium-gray shale interbeds.
— **Pecatonica Member:** 15–20 ft (4.5–6 m) thick. Thin- to medium-bedded, tan- to light-gray, slightly porous, fine-grained crystalline dolomite with wispy, thin, tan- to medium-gray shale partings.

Anell Group

Oa – **Anell Group:** 45–300+ ft (14–92+ m) thick.
— **Glennwood Formation:** 0–2 ft (0–0.6 m) thick. Thin-bedded, pale green, tan and orange variably bioturbated shaly, sandy shale and sandstone. Contains abundant iron sulfide concretions and phosphatic nodules.
— **St. Peter Formation:** 40–300+ ft (12–90+ m) thick.
— **Trent Member:** Thick to massive bedded, white to tan to orange to red to yellow, fine- to coarse-grained quartz sandstone. Contains distinctive upper 2–5 ft (0.6–1.5 m) with abundant purple, brown, orange, and red limonite after iron sulfide.
— **Readstown Member:** White to tan fine-grained sandstone and red to green shale, commonly containing blocks of white, cherty, silicified dolomite.

Prairie du Chien Group

Opc – **Prairie du Chien Group:** 0–225 ft (69 m) thick.
Thin- to massive-bedded, gray and tan, vuggy, variably cherty, fine- to coarse-grained crystalline dolomite with sparse green to light-gray dolomitic siltstone, and dolomitic sandstone. Contains abundant stromatolitic horizons including large domes and digitate colonies.

CAMBRIAN

Jordan Formation

Cj – **Jordan Formation:** 40–80 ft (12–24 m) thick.
Packages of tan to white, fine- to medium-grained, friable, thick-bedded cross stratified sandstone interlayered with thin to medium bedded, pink to white to tan, very fine to coarse grained variably bioturbated dolomitic sandstone. In some areas the upper 15 ft (4.5 m) of the Jordan is a distinctive medium-bedded cross stratified white quartzite interbedded with flat pebble conglomerate.

St. Lawrence Formation

Csl – **St. Lawrence Formation:** 50–100 ft (15–30 m) thick.
Thin-bedded, white to tan, subangular, very fine- to fine-grained, and fine- to medium-grained cross bedded sandstones separated by very thin beds of light tan-green dolomitic siltstone. In the northwestern part of the map area the St. Lawrence is a medium-bedded, light tan sandy dolomite.

Tunnel City Group

Ctc – **Tunnel City Group:** 100 ft (30.5 m) thick.
Very thinly bedded, white and tan, highly bioturbated, shaly, dolomitic, glauconitic, fine-grained sandstone with 2–4 in (5–10 cm) thick interbeds of white and green, cross bedded, medium-grained, glauconitic sandstone.

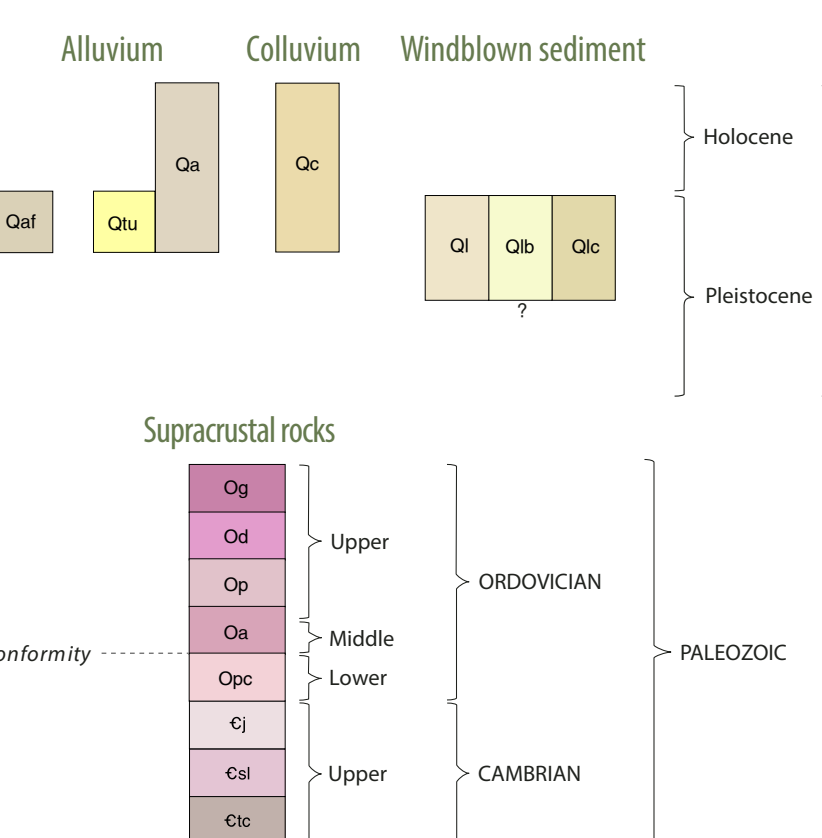
SYMBOLS

Contact—dashed where approximately located
Unconformity—dashed where approximately located
Inclined joint—showing strike and dip
Deformation band—showing strike and dip
Mineralized rock at surface or beneath surficial material
Geologic log from the Mineral Development Atlas
Well construction report

REFERENCES

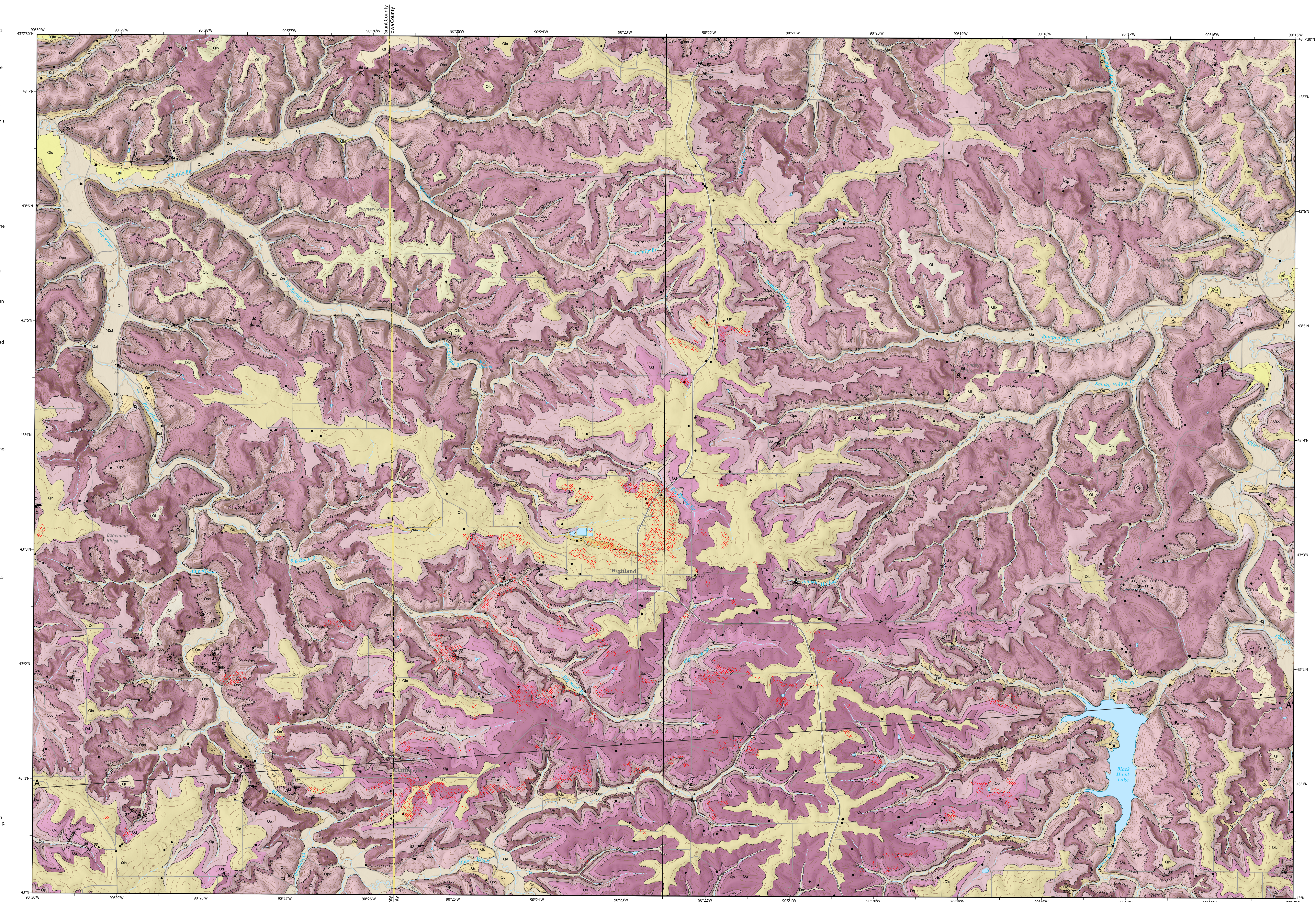
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Wisconsin Geological and Natural History Survey, 2011, Bedrock stratigraphic units in Wisconsin: Wisconsin Geological and Natural History Survey Educational Series 51, 2 p., <https://wgnhs.wisc.edu/catalog/publication/000200>.

CORRELATION OF MAP UNITS

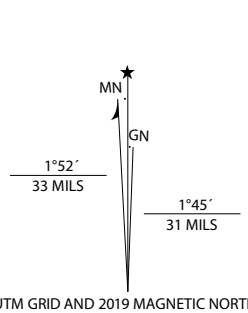


Geologic map of the Highland West and Highland East 7.5-minute quadrangles, Grant and Iowa counties, Wisconsin

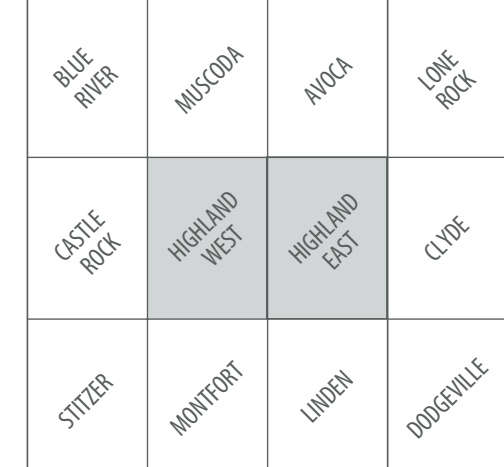
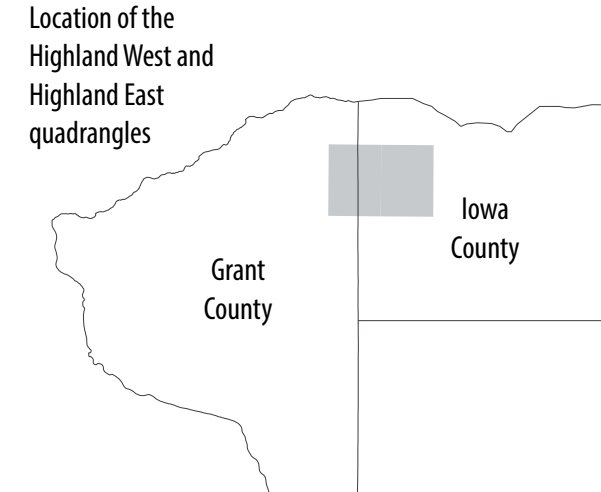
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Mapped and compiled by William A. Fitzpatrick and Eric D. Stewart, 2021–2022. Geodatabase and cartography by Matthew Rehwald and EDS. This geologic map was funded in part by the U.S. Geological Survey National Cooperative Mapping Program under Earth MR award number G16AC10500, 2021.
For further details about the geology presented in this map and cross section, please refer to the accompanying supplemental report at: <https://doi.org/10.54915/nqf2637>
The map and cross sections are interpretations of the data available at the time of preparation. Every reasonable effort has been made to ensure that this interpretation conforms to sound scientific and cartographic principles; however, the map should not be used to guide site-specific decisions without verification.
Proper use of the map is the sole responsibility of the user.



SCALE 1:24 000
0 0.5 1 2 MILES
0 0.5 1 2 KILOMETERS
NAD 1983 HARN Wisconsin Transverse Mercator Projection (Meters)
Contour interval is 20 feet
Shaded-relief image and topographic contours from 5-foot lidar-based digital elevation model, Natural Resources Conservation Service (written commun., 2012).
Magnetic north, hydrologic features, and topographic features from The National Map digital data, U.S. Geological Survey, 2018.



Highland West, Highland East, and adjacent quadrangles

