Preliminary Bedrock Geology of Southern Trempealeau County, Wisconsin

WOFR 2018-01 • Plate 1

STATEMAP Project Year 1 of 2

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EXPLANATION

Ordovician

Oa — **Ancell Group: St. Peter Formation**
Quartz sandstone (Tonti Member) and red and green shale (Readstown Member); observed at one locality above the Prairie du Chien Group on an unconformable surface with an observed relief of up to ~35 feet (~10 m). Members are not mapped separately.

Op — **Prairie du Chien Group**
Consists of the Shakopee and Oneota Formations; not separated at this map scale, and Shakopee Formation yet to be observed. The Oneota Formation is a buff to tan-colored stromatolitic thin- to thick-bedded sandy dolostone with white to cream-colored silica nodules (dolostone facies, Hager City Member) and interbedded dolostone and friable white quartz sandstone and green mudstone of the Stockton Hill Member.
Can be greater than 125 feet (~38 m) thick.

Cambrian

Ct — **Trempealeau Group**
The Trempealeau Group consists of the Jordan and St. Lawrence Formations, which are not mapped separately, and is approximately 125 (~38 m) feet thick.

Jordan Formation
Orange and white cross-bedded coarse-grained quartz sandstone with abundant trough cross-stratification; silica cements are common near the top of this unit as are calcite-cemented concretions ranging from centimeters to decimeters. The Jordan Formation is unconformably overlain by the Stockton Hill Member (Ordovician, lowest Prairie du Chien Group).

St. Lawrence Formation
Subdivided into green and buff to tan glauconitic and thrombolitic dolostone of the Black Earth Member and buff to tan thin planar-bedded siltstone and sandy dolostone of the Lodi Member; these lithostratigraphic members interfinger. The St. Lawrence-Jordan Formation contact is relatively gradational; further study of the contact is necessary.

Ctc — **Tunnel City Group: Lone Rock Formation**
Can be subdivided into three members in the map area, from oldest to youngest, Birkmose, Tomah, and Reno; not separated at this map scale. The Birkmose Member is dolomite-cemented coarse-grained glauconitic sandstone to sandy dolostone with flat-pebble conglomerates, the Tomah Member is a tan to white-colored, medium-grained glauconitic quartz sandstone, and the Reno Member is a glauconitic medium- to coarse-grained quartz sandstone with flat-pebble conglomerates. *Palaeophycus* and *Skolithos* are common, as is hummocky cross-stratification and cross-stratification bounded by horizontal bedding surfaces. The contact of the Lone Rock Member with the overlying St. Lawrence Formation is sharp and unconformable. This formation is approximately 150 feet (~45 m) thick.

Cw — **Elk Mound Group: Wonewoc Formation**
Medium- to coarse-grained quartz sandstone with thin gray and green shale partings; it is orange-colored where cemented by iron-oxides, but can be gray in the subsurface where cemented by iron cements in reduced mineral phases. Phosphatic brachiopod shells occur, as do burrows, primarily *Skolithos*. Large sets of swaley and trough cross-stratification are ubiquitous; cross-stratification bounded by horizontal bedding surfaces is also present. The Tunnel City Group unconformably overlies the Wonewoc Formation, with the Wonewoc Formation commonly reworked into the lowest beds of the overlying unit. This formation is approximately 150 feet (~45 m) thick.

Ce — **Elk Mound Group: Eau Claire Formation**
Coarsening upward sequence of interbedded green to gray shale and fine-grained thin- to medium-bedded glauconitic quartz sandstone. Phosphatic brachiopod shells, disarticulated trilobites, and bioturbation (*Palaeophycus*) are common. Tool-marks, cross-stratification bounded by horizontal bedding surfaces, and hummocky cross-stratification present. The Eau Claire Formation appears to sit unconformably on the underlying Mount Simon Formation, though this contact is only observed in two cores. This formation is approximately 120 feet (~36 m) thick.

Cm — **Elk Mound Group: Mount Simon Formation**
Interbedded quartz sandstone and gray shale; the lower portion of the Mount Simon Formation is shalier based on inspection of well cutting sets and gamma logs. The uppermost Mount Simon Formation, seen in drill core, is bioturbated indicating a marine origin for at least part of the unit. Conglomerates sometimes occur near the base of the Mount Simon Formation where it sits unconformably on Precambrian crystalline basement rocks. The Mount Simon Formation is up to 375 feet (114 m) thick in the map area, though thickness is variable due to relief on the top of the Precambrian basement surface.

Correlation of map units

- Oa — Middle Ordovician
- Sauk-Tippecanoe Sequence Boundary
- Op — Early Ordovician
- major unconformity
- €t, €tc, €w, €e, €m — Late Cambrian
- PALEOZOIC

SYMBOLS

Contact
Position of map unit contact.

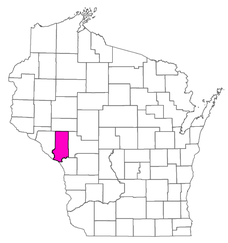
Contact inferred
Position of map unit contact less confident due to limited data.

Drill core hole: Continuous rock core photographed and described at centimeter scale; analyzed for carbon isotope chemostratigraphy at 30 to 120 cm intervals; analyzed for biostratigraphy; geophysical and optical logs collected.

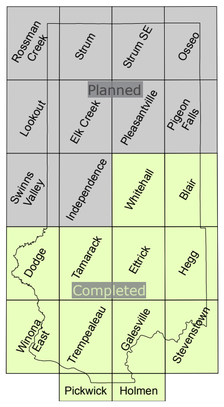
Geologic log: Cuttings described at 5- to 10-foot (1.5 to 3 m) intervals.

Well construction report: Cuttings described by driller.

Outcrops: Exposure of bedrock at land surface. Includes natural outcroppings and roadcuts, as well as active and inactive aggregate quarries, sand mines, sand and shale pits, and small quarries.



Trempealeau County, Wisconsin



Quadrangle Locations

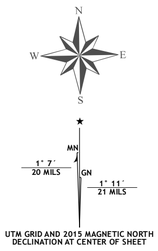
SCALE 1:100,000

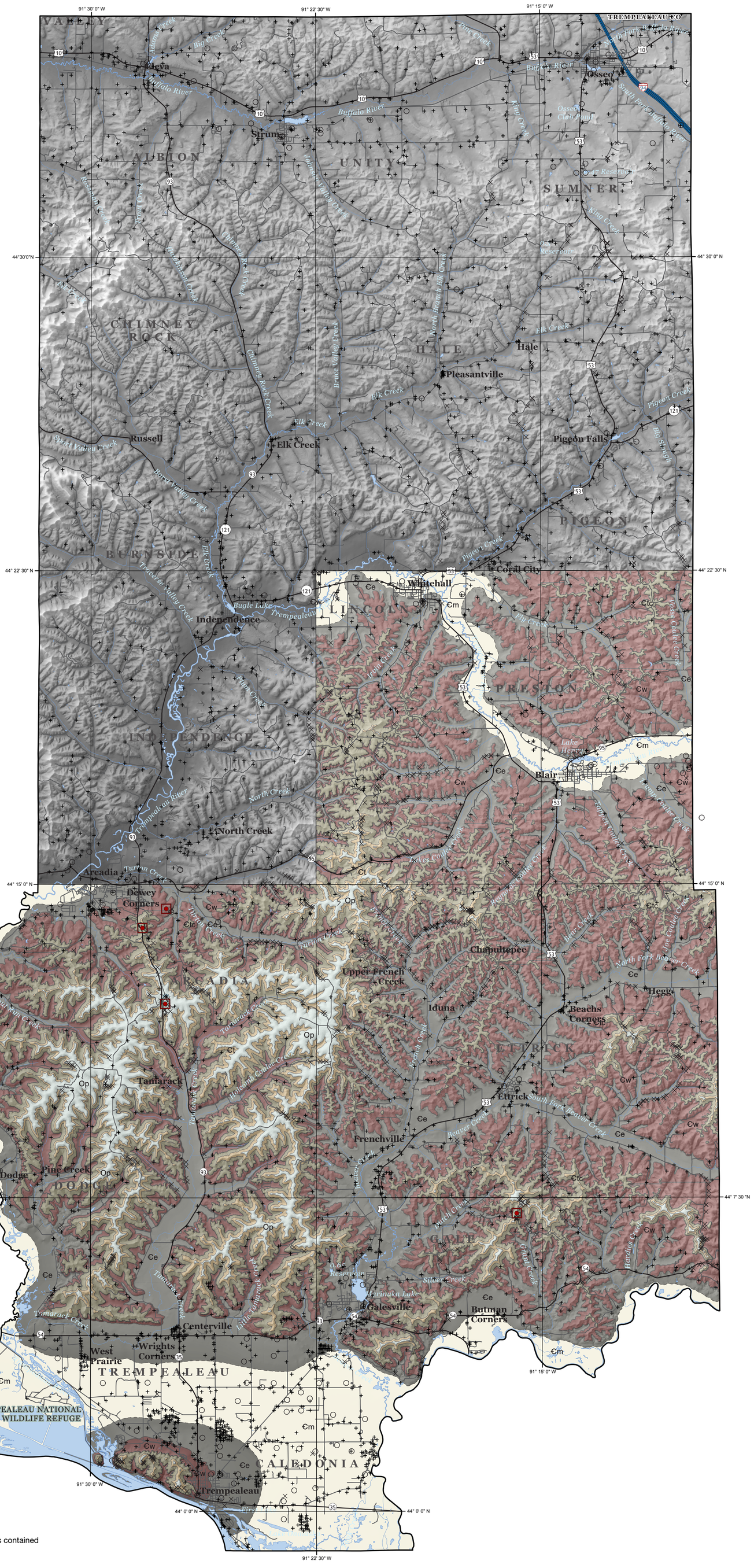
Miles
0 0.5 1 1.5 2 2.5 3 3.5 4 4.5 5
0 1 2 3 4 5 6 7 8
Kilometers

Coordinate System: NAD 1983 HARN Wisconsin
Projection: Tranverse Mercator
Datum: North American 1983

Roads.....CENSUS, 2015
Names.....GNIS, 2015
Hydrography.....National Hydrography Dataset, 2012
Bedrock topography.....Wisconsin Geological Survey, 2017
Boundaries.....Boundaries, multiple sources, 2015

Shaded relief is a representation of the bedrock topography developed by the WGNHS in 2015 specifically for the Trempealeau County STATEMAP project. Details of the development of the bedrock topography are given in an accompanying report.





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