PLEISTOCENE GEOLOGY OF BARRON COUNTY, WISCONSIN

University of Wisconsin-Extension
GEOLOGICAL and NATURAL HISTORY SURVEY
M.E. Ostrom, Director and State Geologist

Information Circular 55 PLATE 1 by Mark D. Johnson 1986

EXPLANATION

MODERN SEDIMENT

Msu Sand and slightly gravelly sand deposited by modern streams; overlain in places by organic material and some silt and clay.

Mbl Boulders of Barron quartzite deposited by mass wasting on talus slopes.

Mom Organic sediment (peat).

COPPER FALLS FORMATION

C5c Sand and gravelly sand deposited by melt-water streams; this unit occurs in unpitted plains. Member status is undefined or unclear.

C5s Sand, gravelly sand, and sandy gravel deposited by melt-water streams and, in places, formerly overlain by till, but now exposed on hillslopes by stream erosion and mass wasting.

CHETEK MEMBER

C5su Sand and gravelly sand deposited by melt-water streams that flowed from the Superior and Chippewa Lobes; this unit occurs in unpitted plains.

C5sp Sand and gravelly sand deposited by melt-water streams that flowed from the Superior and Chippewa Lobes; this unit occurs in pitted plains.

SYLVAN LAKE MEMBER

C4su Undifferentiated till and supraglacial stream sediment deposited by ice, mass movement, and melt-water streams, and later collapsed, in places, after melting of buried ice of the Superior Lobe. Till is yellowish-red to reddish-brown, slightly gravelly, sandy loam. Topography is hummocky (relief 2 to 20 m; surface slope 5° to 20°). This unit includes organic sediment in patches too small to map.

C4suu Undifferentiated till deposited by mass movement from ice of the Superior Lobe and stream sediment deposited by melt-water streams. This sediment forms a sloping plain (2° to 5°) at the margin of the Superior Lobe.

C4sp Sand, gravelly sand, and sandy gravel deposited by melt-water streams from the Superior Lobe; this unit occurs in pitted plains. Coarser material occurs close to former ice-margin positions. This unit includes some sediment in tributaries not receiving melt water. Sediment included within this unit along the Hay River in the southwest part of the county may be older.

C4sh Sand and gravelly sand deposited by melt-water streams and later collapsed by melting of buried ice. Surface is hummocky (relief 2 to 10 m).

C4si Sand, gravelly sand, silt, and slightly gravelly sandy loam deposited by melt-water streams, waves, turbidity currents, and mass movement near the edges of ice-walled lakes; this unit occurs in rims of ice-walled-lake plains.

C4ol Clay, silt, and fine sand deposited by turbidity currents and wind in the centers of ice-walled lakes.

C4li Clay, silt, sand, gravelly sand, and slightly gravelly sandy loam deposited in ice-walled lakes. Mapped in ice-walled-lake plains where **C4si** and **C4ol** were not differentiated.

MIKANA MEMBER

C3su Undifferentiated till and stream sediment deposited by ice, mass movement, and melt-water streams and later collapsed, in places, after melting of buried ice of the Chippewa Lobe. Till is yellowish-red to reddish-brown, slightly gravelly, sandy loam. The topography is hummocky (relief 2 to 20 m; surface slope 10° to 25°). This unit contains many small patches of organic sediment too small to map.

C3sp Sand, gravelly sand, and sandy gravel deposited by melt-water streams of the Chippewa Lobe; this unit occurs in pitted plains. Includes sediment in small tributaries that did not receive melt water.

C3sh Sand, gravelly sand, and sandy gravel deposited by melt-water streams and later collapsed by melting of buried ice. Surface is hummocky, and few remnants of pre-collapse plain exist.

C3li Clay, silt, sand, gravelly sand, and slightly gravelly sandy loam deposited in ice-walled lakes.

POSKIN MEMBER

C2hn Yellowish-red, sandy-loam till deposited by the Superior Lobe; has gently rolling, stream-dissected topography. Patches of Sylvan Lake till too small to map occur within this unit behind the dashed Late St. Croix ice-margin limit in the southwestern part of the county. Outcrops of sandstone are common in the southwest.

C2sp Sand and gravelly sand deposited by melt-water streams from the Superior Lobe; this unit occurs in pitted terraces.

POKEGAMA CREEK MEMBER

C1hn Yellowish-red, slightly gravelly sandy-loam till deposited by the Chippewa Lobe. Till is thin and discontinuous; outcrops of sandstone or Barron quartzite are common.

C1su Sand and gravelly sand deposited by melt-water streams; this unit occurs in unpitted plains south of the ice-margin limit of the Early Chippewa Advance.

C1sp Sand and gravelly sand deposited by melt-water streams; this unit occurs in pitted plains behind the ice-margin limit of the Early Chippewa Advance.

RIVER FALLS FORMATION

PRAIRIE FARM MEMBER

R1hn Yellowish-red, slightly gravelly sandy-loam till deposited by the Chippewa Lobe. The till sheet is thin, and sandstone outcrops are common.

R1ss Sand and gravelly sand deposited by streams. Little original surface topography remains. This sediment contains clay that was deposited by infiltrating surface water to depths as much as 5 m.

UNNAMED MEMBER

R2hn Yellowish-red, slightly gravelly sandy-loam till deposited by the Superior Lobe. The till sheet is thin, and sandstone outcrops are common.

PIERCE FORMATION

P Olive-black, loam till deposited by the Des Moines Lobe. This unit only appears in cross sections.

OTHER UNITS

a Sand and gravel probably deposited by streams and of unknown age. This unit appears only in cross sections.

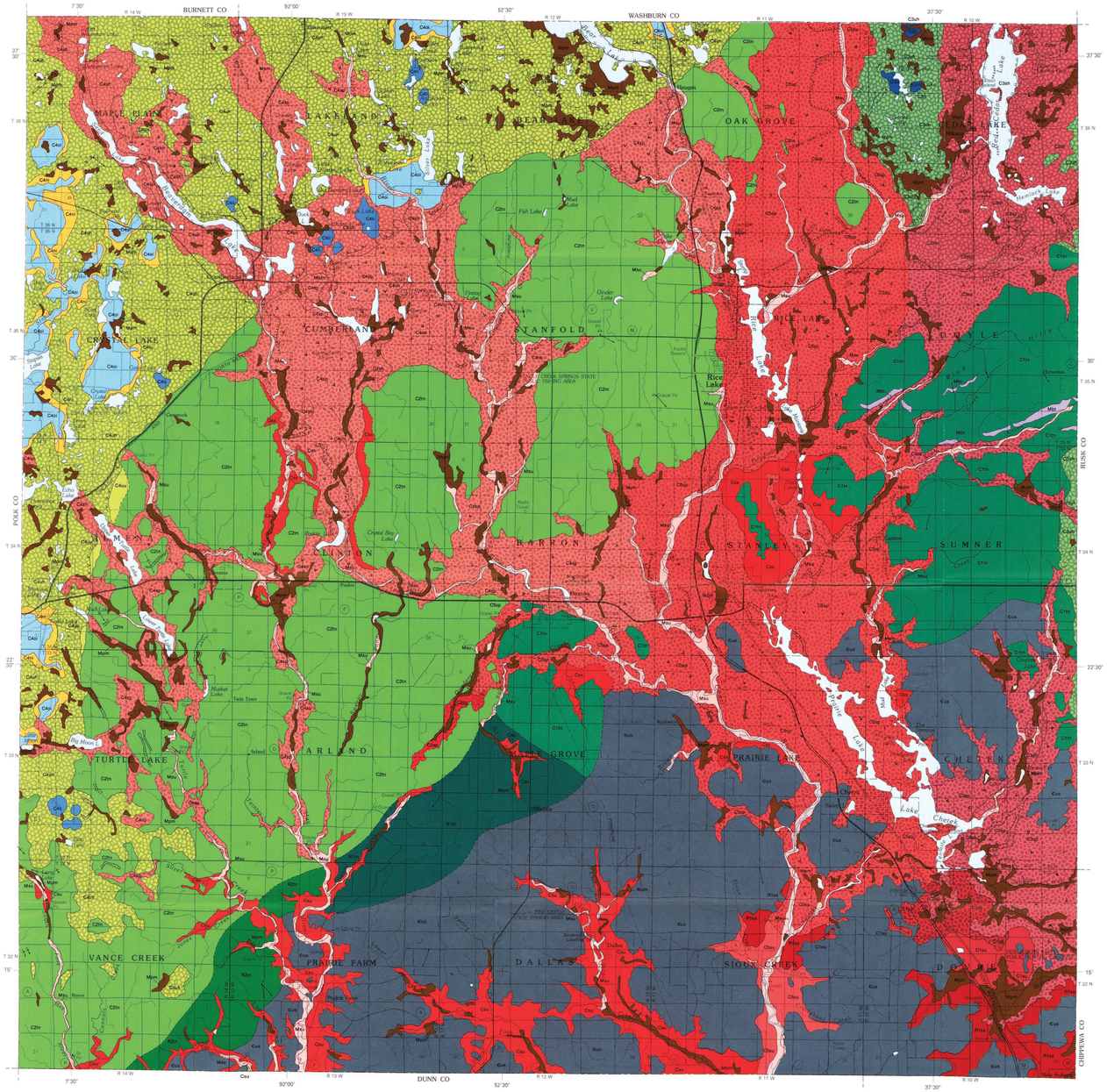
Cus Cambrian sand and sandstone exposed at the surface or capped by a thin layer of silt or till of the River Falls Formation or the Pokegama Creek Member of the Copper Falls Formation. Topography is stream dissected.

CHRONOLOGY

All sediment referred to in map-unit descriptions was deposited during the Pleistocene Epoch, with the exception of the Cambrian sand and sandstone (map unit **Cus**). Modern sediment includes sediment accumulating at present or in the recent past. Most of this sediment has been deposited since the last glaciation, although some boulders (map unit **Mbl**) may have been deposited during the last glaciation.

Sediment included in the Copper Falls Formation was deposited during the last part of the Wisconsin Glaciation, which occurred between 25,000 and 10,000 years ago. Of the five members in this formation, the Pokegama Creek and Poskin Members are the oldest, with the Pokegama Creek Member being slightly older. The Mikana and Sylvan Lake Members are the youngest and were deposited concurrently. Sediment included in the Chetek Member spans this entire period.

Sediment included in the River Falls and Pierce Formations was likely deposited prior to the Wisconsin Glaciation. The Pierce Formation is older than the River Falls Formation and is deeply weathered, even where overlain by River Falls sediment. This indicates the River Falls and Pierce Formations are widely separated in age.



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Cartography by K.M. Campbell

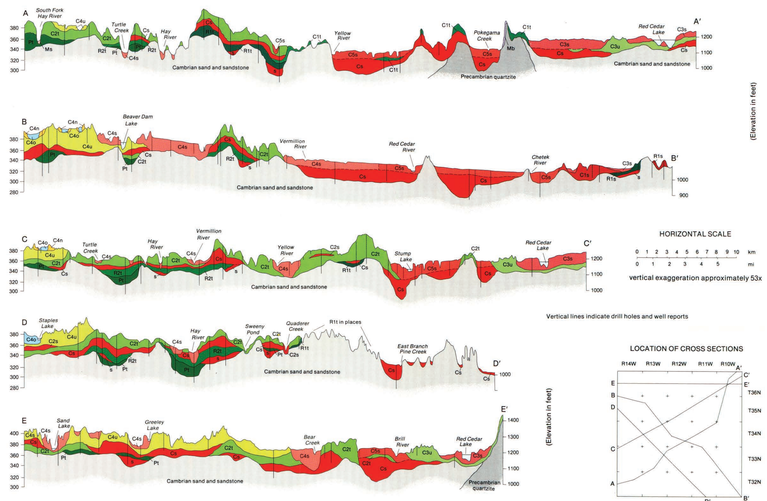
SCALE 1:100,000

1 0 1 2 3 4 5 6 7 8 9 10 KILOMETERS

1 0 1 2 3 4 5 MILES

Base from U.S. Geological Survey
1:100,000 map--Barron County, Wis. (1979)

WISCONSIN GEOLOGICAL and
NATURAL HISTORY SURVEY MAP 86-5



MAP UNITS

Map units are represented by a three-letter symbol. Lithostratigraphy is indicated by the first letter, which represents the formation, and may be followed by a number, which indicates the member. C = Copper Falls Formation; C1 = Pokegama Creek Member; C2 = Poskin Member; C3 = Mikana Member; C4 = Sylvan Lake Member; C5 = Chetek Member; R = River Falls Formation; R1 = Prairie Farm Member; R2 = unnamed member; P = Pierce Formation; € = undifferentiated Cambrian formations.

The second letter indicates sediment. t = till; u = undifferentiated sediment; s = stream sediment; n = nearshore lake sediment; o = offshore lake sediment; l = undifferentiatec lake sediment; b = talus boulders; p = organic sediment.

The third letter indicates surface topography. In cross sections, this letter is dropped. n = gently rolling glacial topography; h = hummocky glacial topography; u = unpitted stream plain; p = pitted stream plain; s = slope formed by hillslope processes on sand, till, or sandstone; i = ice-walled-lake plain; t = talus slope; m = marsh plain.

SYMBOLS

Arrow heads show surface slope of pitted and unpitted stream plains.

Ridge occurring at inferred former ice-margin position. Barbs located on up-ice side.

Tunnel channel sides.

Stream cut scarp. Where paired, they represent large abandoned melt-water channel.

Esker.

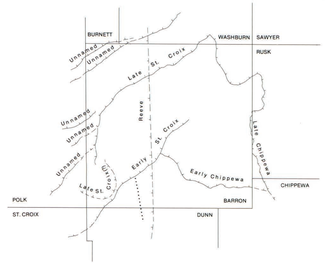
Ice-flow direction interpreted from pebble fabric.

Drumlin.

Striation on in-place sandstone or quartzite.

Geologic boundary.

Inferred geologic boundary.



Ice-margin limits in Barron County area. Dotted line is approximate eastern limit of the Baldwin Advance and western limit of the Dallas Advance.

SOURCES OF INFORMATION

Information used in the construction of this map was obtained during field work in the summers of 1981 and 1982. Field mapping was based on exposures of material in road cuts, gravel pits, excavations, natural exposures, and drill holes. Approximately 275 samples were processed in the Quaternary Lab in the Department of Geology and Geophysics at the University of Wisconsin–Madison. Field mapping was done on U.S. Geological Survey 7.5-minute quadrangles. Photocopies of the original field maps are available on file at the Wisconsin Geological and Natural History Survey.

Surface topography shown on cross sections is from U.S. Geological Survey 15-minute quadrangles. The subsurface sediment is known from surface exposures, drill holes, and well reports of professional well drillers. Well reports are kept on file at the Wisconsin Geological and Natural History Survey. Only those reports whose surface locations could be verified with county plat books were used. Drill holes near several well sites generally contained sediment similar to that described in the well report for that site. However, a few drill holes contained sediment markedly different from that described in the well report. The cross sections are interpretive and are not intended to show what is actually along each line of cross section. Thus, they are an indication of what is likely to be found in the subsurface.