PLEISTOCENE GEOLOGY OF LANGLADE COUNTY, WISCONSIN

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1986

EXPLANATION

POSTGLACIAL SEDIMENT

Ao — Organic sediment: Peat and muck, thickness generally unknown but ranging from less than 1 m to probably greater than 5 m. This unit is underlain by fluvial, glacial, or lacustrine sediment or water. Generally flat, low-lying, small to large bogs, sometimes partly forested.

a — Alluvial sediment: Commonly peat and muck with substantial amounts of sand, silt, or clay. In some cases sand, silt, and clay is more abundant than organic sediment. Contact between alluvial sediment and organic sediment is arbitrary in many places.

SEDIMENT DEPOSITED DURING THE LATE WISCONSIN GLACIATION

COPPER FALLS FORMATION, Bass Lake Member, sediment of the Wisconsin Valley Lobe.

Ugg — Undifferentiated till and till-like sediment in the Harrison Moraine: reddish-brown to brown, crudely stratified, gravelly, sandy-loam and loamy-sand debris-flow sediment and reddish-brown, uniform, compact, gravelly, sandy-loam and loamy-sand till in high-relief hummocky areas parallel to the former ice margin. Hummocks are typically equidimensional or slightly elongate, steep sided, and interspersed with numerous lakes and bogs. Many small areas of organic material and sand and gravel are not mapped as individual units.

Ugpf — Gravel in unpitted fan: Moderately well sorted to well-sorted, well-stratified, predominantly fluvial gravel and sandy gravel in fan-shaped deposits. The original depositional surface is identifiable in more than 80 percent of the unit with only a few pits in the surface due to melting ice blocks. Generally most collapse occurs on proximal (ice-contact) edge of the fan where bodies of till may be present in the gravel.

Ugpa — Gravel in unpitted apron: Poorly to moderately well sorted, predominantly fluvial gravel and sandy gravel underlying relatively steeply sloping surfaces between end moraines and outwash plains. Original depositional surface is identifiable in most areas and pits due to melting ice blocks are few. Gravel is generally coarse.

Ugpt — Gravel in pitted terrace: Well to moderately well sorted, well-stratified, predominantly fluvial gravel and sandy gravel underlying gently sloping plains that are generally along modern water courses. Surface is 3 to 8 m higher than modern flood plain and there is a distinct topographic boundary separating terrace from the flood plain. Original depositional surface is identifiable over about 20 to 80 percent of the area. Pitted areas make up 20 to 80 percent of the surface and were caused by the melting of buried ice.

Ugmp — Gravel in hummocky complex: Poorly to moderately well sorted predominantly fluvial gravel and sandy gravel. Deposits are generally higher than the surrounding land surface. The original depositional surface is present in less than 20 percent of the area. The remainder is hummocky and is caused by collapse of sediment due to melting of buried ice.

COPPER FALLS FORMATION, Nashville Member, sediment of the Langlade Lobe.

Nts — Till and till-like sediment in areas of streamlined topography: Brown to reddish-brown, crudely stratified or unstratified, gravelly, sandy-loam and loamy-sand till. Generally compact, uniform, although in some areas till has been moved by secondary processes and may be partly washed and generally less compact. Landscape contains flutes or drumlins produced by sliding at the glacier bed.

Ntf — Till and till-like sediment underlying rolling topography: Brown to reddish-brown, crudely stratified or unstratified, gravelly, sandy loam or loamy sand. Generally very uniform and compact but in some cases has been moved by secondary processes and is less uniform and compact. Surface does not show streamlining or hummocky topography but has a fairly low relief gently rolling surface.

Ntmp — Till in hummocky end moraines or hummocky complexes. Brown to reddish-brown, crudely stratified, gravelly, sandy-loam and loamy-sand debris-flow sediment and reddish-brown, uniform, compact, slightly gravelly, sandy-loam till in high-relief hummocky areas. Hummocks are typically equidimensional or slightly elongate, steep-sided, and interspersed with numerous lakes and bogs. **Ntmp** is where unit is in an area parallel to the ice margin, and **Ntmc** is where the distribution of hummocky topography has not been controlled by an ice margin.

Ngpf — Gravel in pitted and unpitted fan: Moderately well sorted, well-stratified, predominantly fluvial gravel and sandy gravel in fan-shaped deposits. In **Ngpf** the original depositional surface is preserved in more than 80 percent of the surface area and there are only a few pits in the surface due to melting ice blocks. In **Ngpf** between 20 and 80 percent of the surface is pitted. Generally most collapse occurs on proximal (ice-contact) edge of the fan or bodies of till may be present in the gravel.

Ngut — Gravel in pitted and unpitted plains and terraces: Well to moderately well sorted, well-stratified, predominantly fluvial gravel and sandy gravel underlying gently sloping surfaces. In **Ngup** and **Ngut** over 20 percent of the surface is preserved with only a few pits in the surface due to melting ice blocks. In **Ngpp** and **Ngpt** pits due to melting ice blocks occupy between 20 and 80 percent of the surface. In **Ngup** and **Ngpp** the shape of the gravel deposit is roughly equidimensional or at least not markedly confined to the edges of a modern stream valley. **Ngut** and **Ngpt** indicate terrace surfaces roughly parallel to a modern river but composed of outwash material.

Ngmp — Gravel in equidimensional hummocky complex: Poorly to moderately well sorted, predominantly fluvial gravel and sandy gravel. Deposits are generally higher than the surrounding land surface. The original depositional surface is present in less than 20 percent of the area. The remainder is hummocky and is caused by the collapse of sediment due to melting of buried ice.

Ngua — Gravel in unpitted apron: Poorly to moderately well sorted, predominantly fluvial gravel and sandy gravel underlying relatively steeply sloping surfaces between end moraines and outwash plains. Original depositional surface is identifiable in most areas and pits due to melting ice blocks are few. Gravel is generally coarse.

Nsuf — Sand in unpitted fan: Moderately well sorted to well-sorted, predominantly fluvial sand and gravelly sand in fan-shaped deposits. The original depositional surface is identifiable in more than 80 percent of the unit with only a few pits in the surface due to melting ice blocks. Generally most collapse occurs on proximal (ice-contact) edge of the fan where bodies of till may be present.

Nsut Nsup Nspp — Sand in unpitted terraces and unpitted and pitted plains: Well to moderately well sorted, well-stratified, predominantly fluvial sand and gravelly sand underlying gently sloping surfaces. In **Nsut** and **Nsup** more than 80 percent of the original depositional surface is preserved and there are few pits due to melting ice blocks. In **Nsup** less than 80 percent but more than 20 percent of the original surface is preserved. In **Nsut** the deposit is confined to a zone parallel to a modern stream and is a remnant left by the downcutting of that stream. **Nsup** and **Nspp** are outwash plains that are more or less equidimensional original depositional surfaces that have not been modified by subsequent stream downcutting.

Nsmp — Sand in humocky complex: Poorly to moderately well sorted, predominantly fluvial sand and gravelly sand. Disruption of the bedding is fairly common. Deposits are generally higher than the surrounding land surface. The original depositional surface is present in less than 20 percent of the area. The remainder of the surface is hummocky and is caused by collapse of sediment due to melting of buried ice.

Nslf — Sand in unpitted lacustrine plain: Well-sorted, predominantly medium and fine lacustrine sand underlying relatively flat plains formerly occupied by shallow lakes. Generally occupy a low position in the landscape.

Nspl — Sand, silt, and clay in pitted ice-walled-lake plains: Poorly to moderately well sorted lacustrine sand and silt with some clay underlying somewhat pitted or rolling surfaces. Generally in high places in the landscape indicating that former ice walls confined the lake. Generally associated with hummocky end moraine or hummocky complexes.

HORICON FORMATION, Mapleview Member, sediment of the Green Bay Lobe.

Mts — Till and till-like sediment in areas of streamlined topography: Brown to reddish-brown, crudely stratified or unstratified, gravelly, sandy-loam and loamy-sand till. Generally compact and uniform although in some areas till has been moved by secondary processes and may be partly washed and generally less compact. Landscape contains flutes or drumlins produced by sliding at the glacier bed.

Mtf — Till and till-like sediment underlying rolling topography: Brown to reddish-brown, crudely stratified or unstratified gravelly, sandy loam or loamy sand. Generally very uniform and compact but in some cases has been moved by secondary processes and is less uniform and compact. Surface does not show streamlining or hummocky topography but has a fairly low relief gently rolling surface.

Mtmp — Till in hummocky end moraines and hummocky complexes: Brown to reddish-brown, crudely stratified, gravelly, sandy-loam and loamy-sand debris-flow sediment and reddish-brown, uniform, compact, slightly gravelly, sandy-loam till in high-relief hummocky areas. Hummocks are typically equidimensional or slightly elongate, steep sided, and interspersed with numerous lakes and bogs. **Mtmp** is where unit is in an area parallel to the ice margin, and **Mthc** is where the distribution of hummocks has not been controlled by an ice margin.

Mgpf — Gravel in unpitted fan: Moderately well sorted, well-stratified, predominantly fluvial, gravel and sandy gravel in fan-shaped deposits. The original depositional surface is preserved in more than 80 percent of the surface area and there are only a few pits in the surface due to melting ice blocks. Generally most collapse occurs on proximal (ice-contact) edge of the fan and bodies of till may be present in the gravel.

Mgpa — Gravel in unpitted apron: Poorly to moderately well sorted, predominantly fluvial, gravel and sandy gravel underlying relatively steeply sloping surfaces between end moraines and outwash plains. Original depositional surface is identifiable in most areas and pits due to melting ice blocks are few. Gravel is generally coarse.

Mgup Mgpp — Gravel in pitted and unpitted plains: Well to moderately well sorted, well-stratified, predominantly fluvial, gravel and sandy gravel underlying gently sloping surfaces. In **Mgup** over 20 percent of the surface is preserved with only a few pits in the surface due to melting ice blocks. In **Mgpp** pits due to melting ice blocks occupy between 20 and 80 percent of the surface. The shape of the gravel deposit is roughly equidimensional or at least not markedly confined to the edges of a modern stream valley.

Mghc — Gravel in hummocky or tunnel-channel complex: Poorly to moderately well sorted, predominantly fluvial, gravel and sandy gravel. Deposits are generally higher than the surrounding land surface. The original depositional surface is present in less than 20 percent of the area. The remainder is hummocky and is caused by collapse of sediment due to melting of buried ice. Symbol **Mghn** indicates this unit in tunnel channel.

Msut Msup Mspp — Sand in unpitted terraces and unpitted and pitted plains: Well to moderately well sorted, well-stratified, predominantly fluvial sand and gravelly sand underlying gently sloping surfaces. In **Msut** and **Msup** more than 80 percent of the original depositional surface is preserved and there are few pits due to melting ice blocks. In **Msup** less than 80 percent but more than 20 percent of the original surface is preserved. In **Msut** the deposit is confined to a zone parallel to a modern stream and is a remnant left by the downcutting of that stream. **Msup** and **Mspp** are outwash plains that are more or less equidimensional original depositional surfaces that have not been modified by subsequent stream downcutting.

Mspl — Sand, silt, and clay in pitted ice-walled-lake plains: Poorly to moderately well sorted lacustrine sand and silt with some clay underlying somewhat pitted or rolling surfaces. Generally are in high places in the landscape indicating that former ice walls confined the lake. Generally associated with hummocky end moraine or hummocky complexes.

Undifferentiated sediment of the Langlade and Green Bay Lobes

Ugup Uput Ugpp — Gravel in pitted terrace and unpitted plains: Well to moderately well sorted, well-stratified, predominantly fluvial, gravel and sandy gravel underlying gently sloping surfaces. In **Ugup** over 20 percent of the surface is preserved and the shape of the gravel deposit is roughly equidimensional or at least not markedly confined to the edges of a modern stream valley with only a few pits in the surface due to melting ice blocks. In **Ugpt** and **Ugpp** pits due to melting ice blocks occupy between 20 and 80 percent of the surface. **Ugpt** indicates terrace surfaces roughly parallel to a modern river but composed of outwash material.

Usut Usup Uspp — Sand in unpitted and pitted terraces and plains: Well to moderately well sorted, well- stratified, predominantly fluvial, sand and gravelly sand underlying gently sloping surfaces. In **Usut** and **Usup** more than 80 percent of the original depositional surface is preserved and there are few pits due to melting ice blocks. In **Uspp** and **Uspt** less than 80 percent but more than 20 percent of the original surface is preserved. In **Usut** the deposit is confined to a zone parallel to a modern stream and is a remnant left by the downcutting of that stream. **Usup** and **Uspp** are outwash plains that are more or less equidimensional original depositional surfaces that have not been modified by subsequent stream downcutting.

Usmp — Sand in hummocky complex: Poorly to moderately well sorted, predominantly fluvial sand and gravelly sand. Deposits are generally higher than the surrounding land surface. The original depositional surface is present in less than 20 percent of the area. The remainder of the surface is hummocky and is caused by collapse of sediment due to melting of buried ice.

SEDIMENT DEPOSITED DURING THE EARLY WISCONSIN GLACIATION

LINCOLN FORMATION, Merrill Member

Ll — Till and till-like sediment underlying rolling topography: Brown to reddish-brown, crudely stratified or unstratified, gravelly, sandy loam. Generally very uniform and compact, but in some cases has been moved by secondary processes and is less uniform and compact. Surface does not show streamlining or hummocky topography but has a fairly low relief and is gently rolling.

Lgpl — Gravel in unpitted plains: Well to moderately well sorted, well-stratified, predominantly fluvial gravel and sandy gravel underlying gently sloping surfaces. Over 20 percent of the surface is preserved with only a few pits in the surface due to melting ice blocks. The shape of the gravel deposit is roughly equidimensional or at least not markedly confined to the edges of a modern stream valley.

Lsut Lsup — Sand in unpitted terraces and plains: Well to moderately well sorted, well-stratified, predominantly fluvial sand and gravelly sand underlying gently sloping surfaces. In **Lsut** and **Lsup** more than 80 percent of the original depositional surface is preserved and there are few pits due to melting ice blocks. In **Lsut** the deposit is confined to a zone parallel to a modern stream and is a remnant left by the downcutting of that stream. **Lsup** is outwash plain that is more or less equidimensional original depositional surface that has not been modified by subsequent stream downcutting.

SEDIMENT DEPOSITED BEFORE THE WISCONSIN GLACIATION

MARATHON FORMATION, Wausau Member

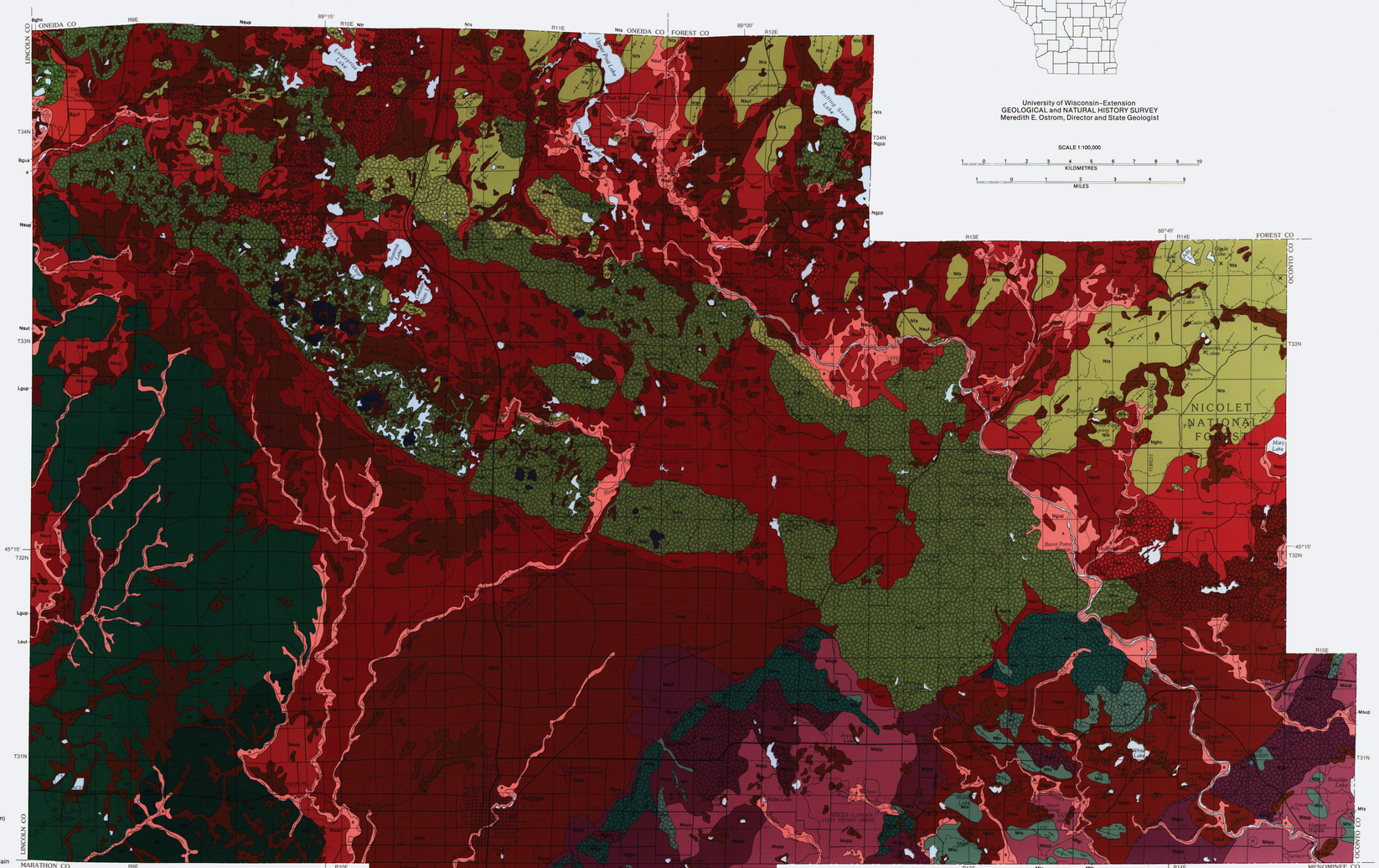
Mdc — Till and till-like sediment: Gray (unweathered) to yellowish-brown (weathered) loam to sandy-loam till. Generally compact and uniform but may have been moved by slope processes since deposition. May include some sand and gravel.

MAP SYMBOLS

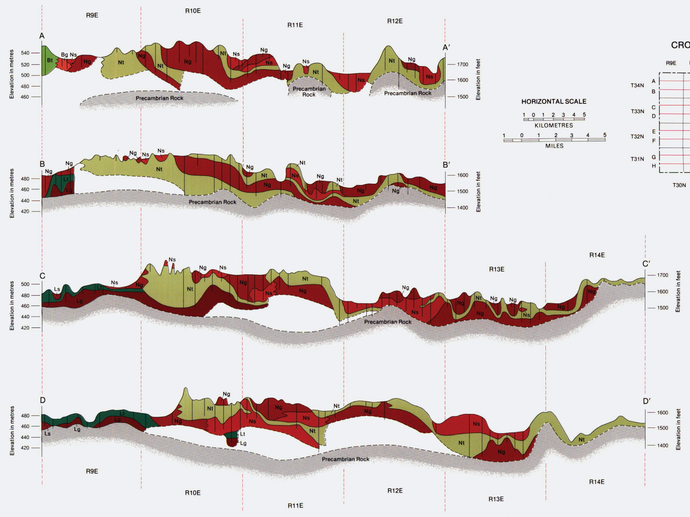
- Long axis of drumlin and direction of ice flow.
- Esker. Symbol shows flow direction and extent of fluvial sediment deposited in subglacial tunnels.
- × Outcrop of Precambrian rock.
- Crests of moraine ridges and other ridges formed parallel to the ice margin.
- Ice-margin position; dashed where indefinite.
- Ice contact face of ice-marginal fans and plains. Barbs point up-ice.
- Clear contact between map units. This symbol is used where lithology and and morphology provide good evidence for contact placement. This type of contact is judged to generally be located within 100 m of the true contact.
- Arbitrary contact between map units used to separate areas of similar morphology and lithology but interpreted to belong to different lithostratigraphic units. This type of contact is judged to generally be located within 1 km of its true location.

Each map unit with the exception of organic sediment (o) and alluvium (a) is designated on the map using a three- or four-letter symbol. The letters, defined as follows, are combined to produce the map unit designations. In the cross sections only two-letter symbols are used. These represent the lithostratigraphic unit and the material. Organic and alluvial units are not shown on the cross sections because of scale. The section lines represent strips 1.5 to 3 km wide for which the stratigraphy has been generalized. Data used for construction of the cross sections are from borings done for this study and records for low-capacity and high-capacity wells on file at the Wisconsin Geological and Natural History Survey.

First letter (lithostratigraphy)	Second letter (material)	Third letter (modifiers)	Fourth letter (landform)
W = Wausau Member	t = till and supraglacial sediment	p = pitted	t = terrace
L = Merrill Member	g = fluvial gravel and sand	h = hummocky	f = fan
N = Nashville Member	s = fluvial and lacustrine sand	s = streamlined	a = apron
B = Bass Lake Member	c = lacustrine silt and clay	r = gently rolling	p = plain
M = Mapleview Member		u = uncollapsed	l = ice-walled-lake plain
U = Undifferentiated			l = lake plain
			n = tunnel channel
			c = complex
			e = end moraine



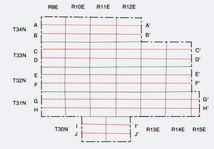
Base map from U.S. Geological Survey Iron Mountain, MICH.-WIS. (1976) and Merrill, WIS. (1977) 1:100,000 quadrangle maps.

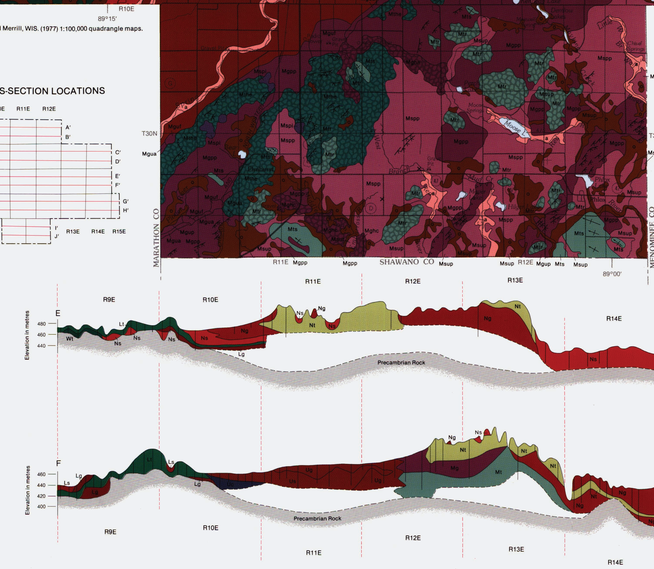


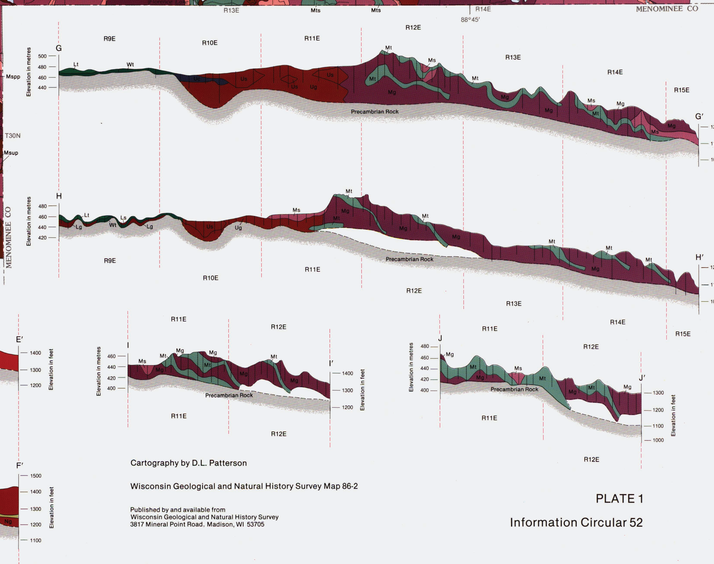
HORIZONTAL SCALE

1 0 1 2 3 4 5
KILOMETRES
1 0 1 2 3 4 5
MILES

CROSS-SECTION LOCATIONS







Cartography by D.L. Patterson

Wisconsin Geological and Natural History Survey Map 86-2

Published by and available from
Wisconsin Geological and Natural History Survey
3817 Mineral Point Road, Madison, WI 53705

PLATE 1

Information Circular 52

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

SCALE 1:100,000

1 0 1 2 3 4 5 6 7 8 9 10
KILOMETRES
1 0 1 2 3 4 5
MILES