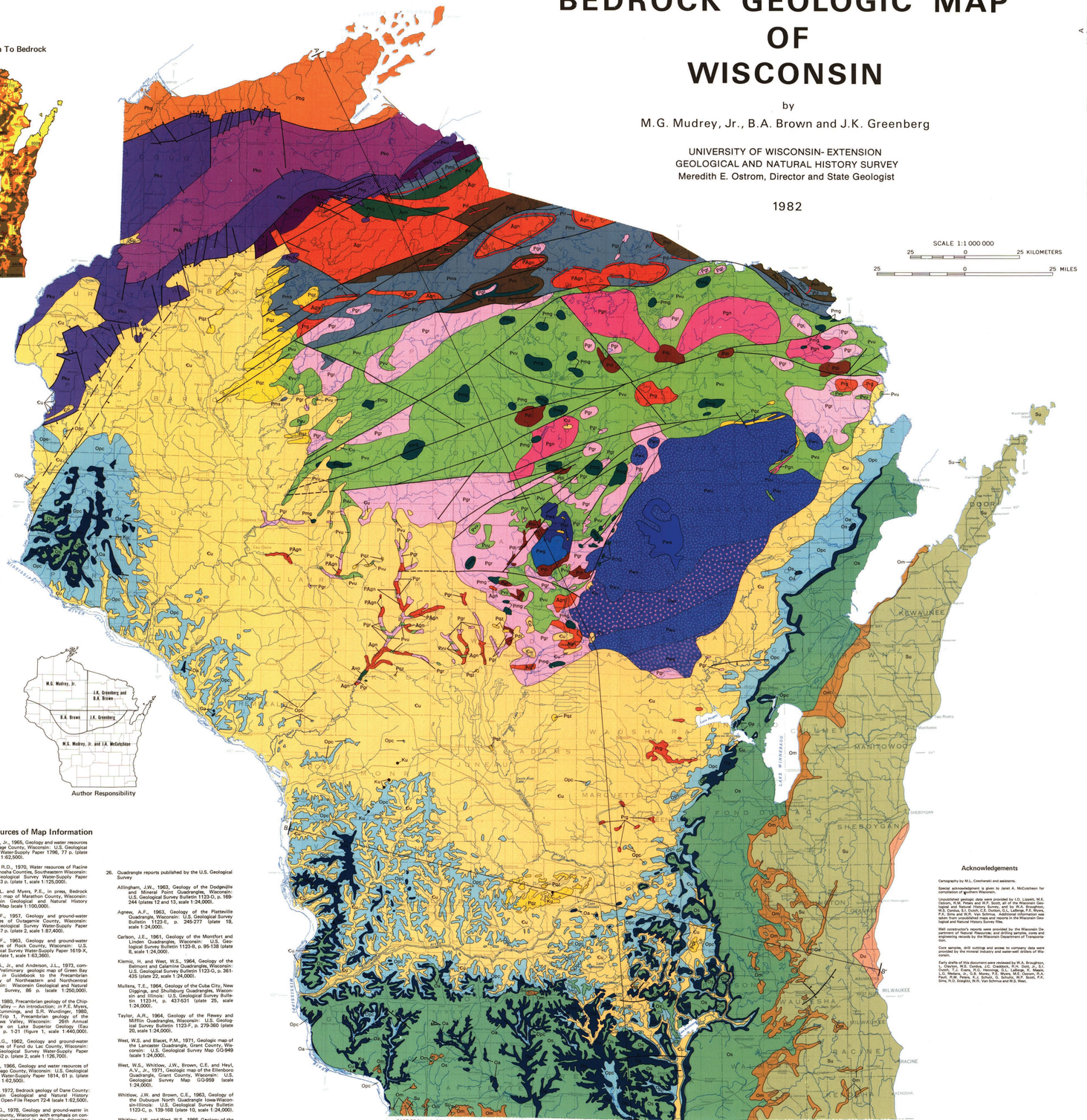
BEDROCK GEOLOGIC MAP OF WISCONSIN

by

M.G. Mudrey, Jr., B.A. Brown and J.K. Greenberg

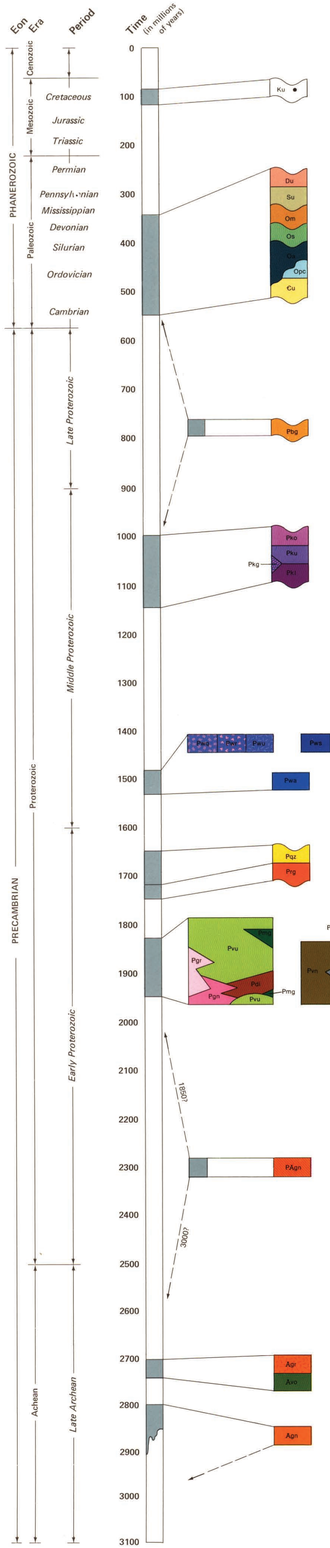
UNIVERSITY OF WISCONSIN- EXTENSION
GEOLOGICAL AND NATURAL HISTORY SURVEY
Meredith E. Ostrom, Director and State Geologist

1982



EXPLANATION OF MAP UNITS

CORRELATION



DESCRIPTION

PHANEROZOIC ROCKS

Sediments of Mesozoic (?) Age

Cretaceous (?) System

Ku Non-marine, gravel and iron-rich clay

Sedimentary Rocks of Paleozoic Age

Devonian System

Du Dolomite, shaly limestone and shale, undivided

Silurian System

Su Dolomite, undivided; includes Cayugan, Niagaran and Alexandrian series

Ordovician System

Om Maquoketa Formation—shale, dolomitic shale and dolomite; includes overlying Neda Formation (age uncertain) consisting of oolitic iron oxides and shale

Os Sinnipee Group—dolomite with some limestone and shale; includes Galena, Decorah and Platteville Formations

Oa Ancell Group—orthoquartzitic sandstone with minor limestone, shale and conglomerate; includes Glenwood and St. Peter Formations

Opc Prairie du Chien Group—dolomite with some sandstone and shale; includes Shakopee and Oneota Formations

Cambrian System

Cu Sandstone with some dolomite and shale, undivided; includes Trempealeau, Tunnel City and Elk Mound Groups.

Sedimentary Rocks of Paleozoic or Proterozoic Age

Cambrian (?) or Upper Proterozoic System

Pbg Bayfield Group—feldspathic quartzose sandstone with some orthoquartzitic sandstone; includes Chequamegon, Devils Island and Orienta Formations

PRECAMBRIAN ROCKS

Sedimentary, Igneous and Metamorphic Rocks of Proterozoic Age

Middle Proterozoic System

KEWEENAWAN SUPERGROUP

Pko Oronto Group—feldspathic sandstone, siltstone, shale and conglomerate; includes Freda and Nonesuch Formations and Copper Harbor Conglomerate

Pku Upper volcanic sequence—basalt flows and minor interbedded sedimentary rocks; includes Chengwatana Volcanic Group in west and Portage Lake Volcanics in east

Pkl Lower volcanic sequence—mafic volcanic rocks and underlying quartzite; includes Powder Mill Group and Bessemer Quartzite

Pkg Intrusive mafic and associated rock—gabbro, troctolite, ferrogranodiorite, granophyre and anorthosite; includes Mellen Intrusive Complex, intrusive complex of Mineral Lake and Round Lake and Clam Lake intrusions

WOLF RIVER BATHOLITH

Pwg Granite of Ninemile Swamp area Near Wausau

Pws Syenite and associated rocks near Stettin and Wausau

Pwv Granitic and syenitic rocks of the Wolf River batholith, undivided

Pwr Quartz monzonite near the Red River, Shawano County

Pwq Rapakivi-textured quartz monzonite near Waupaca

Pwa Anorthosite and gabbro inclusions near Tigerton (age uncertain)

Lower Proterozoic System

Pgz Quartzite and associated slate, dolomite, ferruginous slate, conglomerate and chert; includes Baraboo and Waterloo Quartzites in south, Barron Quartzite in northwest, metasedimentary inclusions in Wolf River rocks including Rib Mountain, Mosinee Hill and McCaslin Quartzites, and other metasedimentary rocks of uncertain stratigraphic position which occur as inliers and outliers in central Wisconsin

Pg Granite and coeval rhyolite of south central Wisconsin and post-tectonic granite in northern Wisconsin: may include Pgz in part

INTRUSIVE ROCKS

Pgr Intermediate to granitic intrusive rocks generally discrete, weakly to moderately deformed bodies

Pdi Tonalitic to granodioritic rocks, massive to foliated and commonly intruded by granitic rocks including aplite and pegmatite

Pgn Banded, layered and migmatitic gneiss with subordinate amphibolite and biotite schist

Pmg Metamorphosed ultramafic to mafic intrusive rocks; includes a layered sequence near Merrill and magnetic units of unknown composition

METAVOLCANIC and METASEDIMENTARY ROCKS (correlation in part with the Marquette Range Supergroup)

Pms Meta-argillite, meta-siltstone, quartzite, meta-graywacke, meta-conglomerate, meta-iron-formation and marble, with some minor interbedded metavolcanic rocks; including Tyler Formation, Palms Quartzite and Bad River Dolomite

Pif Magnetic iron-formation, known or inferred from areal magnetic surveys; includes Ironwood and Riverton Iron-formations

Pvn Dominantly mafic metavolcanic rocks with subordinate felsic metavolcanic rocks; greenschist and amphibolite metamorphic facies

Pvu Mafic, intermediate and felsic metavolcanic rocks with subordinate metasedimentary rocks; dominantly of greenschist metamorphic facies; more than one metavolcanic sequence is recognized; widely distributed in north central areas

Metamorphic Rocks of Proterozoic or Archean Age

PAgn Quartzofeldspathic and migmatitic gneiss with amphibolite and biotite schist

Igneous and Metamorphic Rocks of Archean Age

Upper Archean System

Agr Granite and associated rocks; includes Puritan Quartz Monzonite

Avo Mafic to intermediate metavolcanic rocks and associated metasedimentary rocks; includes Ramsey Formation in Iron County, and iron-formation in Jackson County

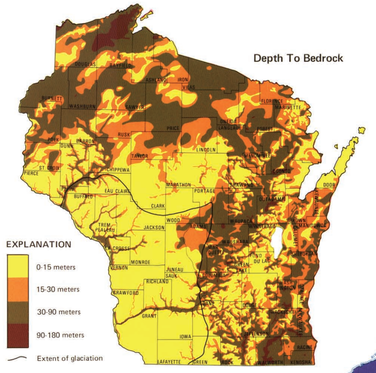
Agn Quartzofeldspathic gneiss, migmatite and amphibolite

geologic contact

fault, ball and bar on downthrown side
dashed where projected

Open water, geology uncertain.

B — B' Cross section.



Less than 15 m of surficial material — generally good to excellent outcrop, particularily on hillside, road cuts and in river valleys.

15 to 30 m of surficial material — poor to no outcrop. Outcrop may occur in isolated exposures particularly in river valleys and bedrock highs. Shallow water wells commonly penetrate bedrock.

Greater than 30 m of surficial material — generally no outcrop. Outcrops occur only in deep river valleys and bedrock highs. Only mineral exploration bore holes and deep municipal wells penetrate bedrock.

SOURCES OF OTHER INFORMATION

Anderson, J.L., 1980, Mineral equilibria and crystallization conditions in the late Precambrian Wolf River rapakivi massif, Wisconsin: American Journal of Science, v. 280, p. 268-332.

Andrews, G.W. 1958, Window Formation of Upper Mississippi Valley region: A sedimentary and stratigraphic study: Journal of Geology, v. 66, no. 6, p. 597-624.

Dott, R.H., Jr., and Dalziel, I.W.D., 1972, Age and correlation of the Baraboo quartzite, south-central Wisconsin: Journal of Geology, v. 80, p. 352-366.

Greenberg, J.K., and Brown, B.A., Lower Proterozoic Violanto rocks and their setting in the southern Lake Superior District: Geological Society of America Bulletin (in press).

Heyl, A.V., Jr., Agnew, A.F., Lyons, E.J., and Behn, R.D., 1969, Geology of the Upper Mississippi Valley Zinc-Lead District: U.S. Geological Survey Professional Paper 309, 310 p.

Klemic, H., and Chiburis, J.M., 1973, Guidebook to the geology and mineral deposits of the Central Part of Jackson County and part of Clark County, Wisconsin: Wisconsin Geological and Natural History Survey, 27 p.

LaBerge, G.L., and Mudrey, M.G., Jr., 1976, Status Report on the Precambrian geology of the Wausau Area, Middle Precambrian: Wisconsin Geological and Natural History Survey Miscellaneous Paper MP-79-2, 39 p.

Maass, R.S., and Van Schmus, W.R., 1980, Field Trip 2, Precambrian tectonic history of the Black River Valley Field Guide: 26th Annual Institute on Lake Superior Geology (Eau Claire), 43 p.

Ostrom, M.E., 1967, Paleozoic stratigraphic nomenclature for Wisconsin: Wisconsin Geologic and Natural History Survey Information Circular No. 8.

Ostrom, M.E., 1978, Stratigraphic relationships of Lower Paleozoic rocks of Wisconsin: *in* Lithostratigraphic, biostratigraphic, and paleomagnetic units, Upper Early Ordovician rocks near Madison, Wisconsin: Wisconsin Geological and Natural History Survey Field Trip Guide Book No. 3, p. 3-22.

Sims, P.K., 1990, Boundary between Archean prerestene and greta terranes in Northern Wisconsin and Michigan: Geological Society of America Special Paper 182, p. 113-124.

Sims, P.K., and Peterman, Z.E., 1980, Geology and Rb-Sr age of Penokean granites in Marinette County, Northeastern Wisconsin: Geological Society of America Special Paper 182, p. 139-146.

Sims, P.K., Peterman, Z.E., and Prinz, W.C., 1977, Geology and Rb-Sr age of Precambrian W Puritan Quartz Monzonite, Florence County, Wisconsin: U.S. Geological Survey Journal of Research, v. 5, no. 2, p. 185-192.

Smith, E.I., 1978, Precambrian rhyolites and granites in South-Central Wisconsin: Field relations and geochemistry: Geological Society of America Bulletin, v. 89, no. 6, p. 879-890.

Stacey, J.S., Cole, B.R., Silver, L.T., and Zartman, R.E., 1976, Plumbotectonics IIA, Precambrian massive sulfide deposits: U.S. Geological Survey Open-file Report 76-476, 39 p.

Thwaites, F.T., 1940, Buried Precambrian of Wisconsin: Wisconsin Academy of Sciences, Arts and Letters Transactions, v. 32, p. 213-247.

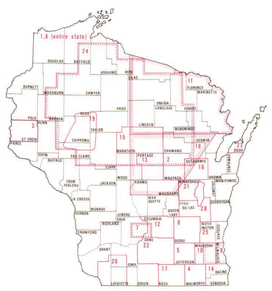
Van Schmus, W.R., 1980, Chronology of igneous rocks associated with the Penokean orogeny in Wisconsin: Geological Society of America Special Paper 182, p. 159-165.

Van Schmus, W.R., and Anderson, J.L., 1977, Gneiss and migmatite of Archean age in the Precambrian basement of Central Wisconsin: Geology, v. 5, p. 45-48.

Van Schmus, W.R., Medaris, L.G., Jr., and Banks, P.O., 1975, Geology and age of the Wolf River Batholith, Wisconsin: Geological Society of America Bulletin, v. 86, p. 907-914.

Van Schmus, W.R., Thurman, E.M., and Peterman, Z.E., 1975, Geology and Rb-Sr chronology of Middle Precambrian rocks in Eastern and Central Wisconsin: Geological Society of America Bulletin, v. 86, p. 1255-1264.

Zeitz, I., Karl, J.H., and Devaun, M.E., 1976, Preliminary aeromagnetic reconnaissance of the Precambrian terrane in Wisconsin: U.S. Geological Survey Miscellaneous Field Study MF-888.



Author Responsibility

Principal Sources of Map Information

1. Bean, E.F., 1949, Geologic Map of Wisconsin: Wisconsin Geological and Natural History Survey Map (scale 1:1,000,000).
2. Berkstresser, C.F., Jr., 1964, Ground-water resources of Waupaca County, Wisconsin: U.S. Geological Survey Water-Supply Paper 1669-U, 38 p. (plate 2, scale 1:62,500).
3. Borman, R.G., 1976, Ground-water resources and geology of St. Croix County, Wisconsin: Wisconsin Geological and Natural History Survey Information Circular No. 32, 30 p. (figure 2, scale 1:297,000).
4. Borman, R.G., 1976, Ground-water resources and geology of Walworth County, Wisconsin: Wisconsin Geological and Natural History Survey Information Circular No. 34, 45 p. (figure 2, scale 1:269,600).
5. Borman, R.G., and Trotta, L.C., 1976, Ground-water resources and geology of Jefferson County, Wisconsin: Wisconsin Geological and Natural History Survey Information Circular No. 33, 31 p. (figure 2, scale 1:269,600).
6. Dewaul, R.W., and Schiller, J.J., in press, Ground-water resources of Dodge County, Wisconsin: Wisconsin Geological and Natural History Survey Information Circular (figure 2, scale 1:314,910).
7. Dott, R.H., Jr., 1970, Synthesizer. Geologic map of the Baraboo district, Columbia and Sauk Counties, Wisconsin: *in* I.W.D. Dalziel and R.H. Dott, Jr., 1970, Geology of the Baraboo District, Wisconsin: Wisconsin Geological and Natural History Survey Information Circular No. 14, 164 p. (plate 2, scale 1:62,500).
8. Dutton, C.E. and Bradley, R.E., 1970, Lithologic, geophysical, and mineral commodity maps of Precambrian rocks in Wisconsin: U.S. Geological Survey Miscellaneous Geologic Investigations Map I-631 (sheets 3 and 5, scale 1:500,000).
9. Foley, F.C., Walton, W.C. and Dreeher, W.J., 1953, Ground-water conditions in the Milwaukee-Waukesha area, Wisconsin: U.S. Geological Survey Water-Supply Paper 1229, 96 p. (figure 2, scale 1:406,150).
10. Goerlitz, J.B., 1975, Ground-water resources of Waukesha County, Wisconsin: Wisconsin Geological and Natural History Survey Information Circular No. 29, 47 p. (figure 2, scale 1:267,700).
11. Greenberg, J.K. and Brown, B.A., 1980, Northeastern Wisconsin preliminary bedrock geology — Review Copy: Wisconsin Geological and Natural History Survey Map (scale 1:250,000).
12. Harr, C.A., Trotta, L.C. and Borman, R.G., 1978, Ground-water resources and geology of Columbia County, Wisconsin: Wisconsin Geological and Natural History Survey Information Circular No. 37, 30 p. (figure 2, scale 1:269,600).
13. Holt, C.L.R., Jr., 1965, Geology and water resources of Portage County, Wisconsin: U.S. Geological Survey Water-Supply Paper 1796, 77 p. (plate 1, scale 1:62,500).
14. Hutchinson, R.D., 1970, Water resources of Racine and Kenosha Counties, Southeastern Wisconsin: U.S. Geological Survey Water-Supply Paper 1878, 63 p. (plate 1, scale 1:125,000).
15. LaBerge, G.L. and Myers, P.E., in press, Bedrock geologic map of Marathon County, Wisconsin: Wisconsin Geological and Natural History Survey Map (scale 1:100,000).
16. LeRoux, E.F., 1967, Geology and ground-water resources of Outagamie County, Wisconsin: U.S. Geological Survey Water-Supply Paper 1421, 57 p. (plate 2, scale 1:87,400).
17. LeRoux, E.F., 1963, Geology and ground-water resources of Rock County, Wisconsin: U.S. Geological Survey Water-Supply Paper 1619-X, 50 p. (plate 1, scale 1:63,360).
18. Medaris, L.G., Jr., and Anderson, J.L., 1973, compilers, Preliminary geologic map of Green Bay Sheet: *in* Guidebook to the Precambrian Geology of Northeastern and Northcentral Wisconsin: Wisconsin Geological and Natural History Survey, 86 p. (scale 1:250,000).
19. Myers, P.E., 1980, Precambrian geology of the Chippewa Valley — An introduction: *in* P.E. Myers, M.L. Cummings, and S.R. Wurdinger, 1980, Field Trip 1, Precambrian geology of the Chippewa Valley, Wisconsin: 26th Annual Institute on Lake Superior Geology (Eau Claire), p. 1-21 (figure 1, scale 1:440,000).
20. Newport, T.G., 1962, Geology and ground-water resources of Fond du Lac County, Wisconsin: U.S. Geological Survey Water-Supply Paper 1604, 52 p. (plate 2, scale 1:126,700).
21. Olcott, P.G., 1968, Geology and water resources of Winnebago County, Wisconsin: U.S. Geological Survey Water-Supply Paper 1814, 61 p. (plate 1, scale 1:62,500).
22. Olcott, P.G., 1972, Bedrock geology of Dane County: Wisconsin Geological and Natural History Survey Open-File Report 72-4 (scale 1:62,500).
23. Sherrill, M.G., 1978, Geology and ground-water in Door County, Wisconsin with emphasis on contamination potential in the Silurian dolomite: U.S. Geological Survey Water-Supply Paper 2047, 38 p. (figure 2, scale 1:660,000).
24. Sims, P.K., Cannon, W.F. and Mudrey, M.G., Jr., 1978, Preliminary geologic map of Precambrian rocks in part of northern Wisconsin: U.S. Geological Survey Open-file Report 78-318 (scale 1:250,000).
25. Young, H.L. and Batten, W.G., 1980, Ground-water resources and geology of Washington and Ozaukee Counties, Wisconsin: Wisconsin Geological and Natural History Survey Information Circular No. 38, 37 p. (figure 2, scale 1:288,000).
26. Quadrangle reports published by the U.S. Geological Survey

Allingham, J.W., 1963, Geology of the Dodgeville and Mineral Point Quadrangles, Wisconsin: U.S. Geological Survey Bulletin 1123-D, p. 169-244 (plates 12 and 13, scale 1:24,000).

Agnew, A.F., 1963, Geology of the Platteville Quadrangle, Wisconsin: U.S. Geological Survey Bulletin 1123-E, p. 245-277 (plate 19, scale 1:24,000).

Carlson, J.E., 1961, Geology of the Montfort and Linden Quadrangles, Wisconsin: U.S. Geological Survey Bulletin 1123-B, p. 95-138 (plate 8, scale 1:24,000).

Klemic, H. and West, W.S., 1964, Geology of the Belmont and Calamine Quadrangles, Wisconsin: U.S. Geological Survey Bulletin 1123-G, p. 361-435 (plate 22, scale 1:24,000).

Mullens, T.E., 1964, Geology of the Cuba City, New Diggings, and Shullsburg Quadrangles, Wisconsin and Illinois: U.S. Geological Survey Bulletin 1123-H, p. 437-531 (plate 26, scale 1:24,000).

Taylor, A.R., 1964, Geology of the Rewey and Mifflin Quadrangles, Wisconsin: U.S. Geological Survey Bulletin 1123-F, p. 279-360 (plate 20, scale 1:24,000).

West, W.S. and Blaser, P.M., 1971, Geologic map of the Lancaster Quadrangle, Grant County, Wisconsin: U.S. Geological Survey Map GQ-949 (scale 1:24,000).

West, W.S., Whitlow, J.W., Brown, C.E. and Heyl, A.V., Jr., 1971, Geologic map of the Ellenboro Quadrangle, Grant County, Wisconsin: U.S. Geological Survey Map GQ-959 (scale 1:24,000).

Whitlow, J.W. and Brown, C.E., 1963, Geology of the Dubuque North Quadrangle Iowa-Wisconsin-Illinois: U.S. Geological Survey Bulletin 1123-C, p. 139-168 (plate 10, scale 1:24,000).

Whitlow, J.W. and West, W.S., 1966, Geology of the Potosi Quadrangle, Grant County, Wisconsin and Dubuque County, Iowa: U.S. Geological Survey Bulletin 1123-I, p. 533-571 (plate 33, scale 1:24,000).

Whitlow, J.W. and West, W.S., 1966, Geologic map of the Kieler Quadrangle, Grant County, Wisconsin and Jo Daviess County, Illinois: U.S. Geological Survey Map GQ-487 (scale 1:24,000).

Whitlow, J.W. and West, W.S., 1966, Geologic map of the Dickeyville Quadrangle, Grant County, Wisconsin: U.S. Geological Survey Map GQ-488 (scale 1:24,000).

Acknowledgements

Cartography by M.L. Czechanski and assistants.

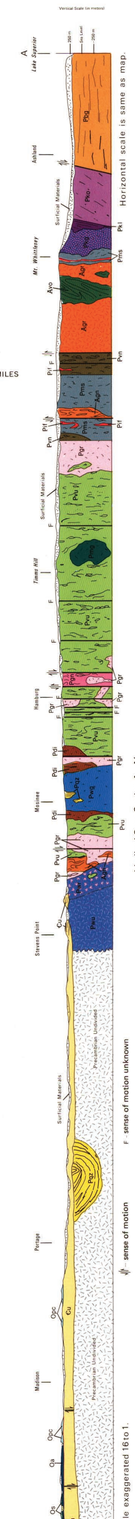
Special acknowledgment is given to Janet A. McCutcheon for compilation of southern Wisconsin.

Unpublished geologic data were provided by I.D. Lisperin, M.E. Ostrom, R.M. Peters and W.F. Scott, all of the Wisconsin Geological and Natural History Survey, and by W.A. Broughton, L.G. Carter, J.C. Cravath, R.H. Dott, Jr., J.H. Fetter, J.H. Fish, P.K. Sims and W.R. Van Schmus. Additional information was taken from unpublished maps and reports in the Wisconsin Geological and Natural History Survey files.

Well constructor's reports were provided by the Wisconsin Department of Natural Resources; and drilling samples, cores and engineering records by the Wisconsin Department of Transportation.

Core samples, drill cuttings and access to company data were provided by the mineral industry and water-well drillers of Wisconsin.

Early drafts of this document were reviewed by W.A. Broughton, L. Clayton, W.E. Cambia, J.C. Cravath, R.H. Dott, Jr., S.I. Dutch, T.J. Evans, R.G. Heinrichs, G.L. LaBerge, K. Maass, D.M. Mickelson, M.E. Ostrom, R.M. Peters, J.H. Powers, R.J. Paull, R.M. Peters, R.J. Schulz, D. Schulte, W.F. Scott, P.K. Sims, R.D. Stieglitz, W.R. Van Schmus and W.S. West.


Vertical Scale (in meters)
A
Lake Superior
Ashland
Mt. Whittlesey
Barron Mountain
Tenny Hill
Stevens Point
Marquette
Portage
Madison
Kewaunee
Wis.-Ill. Border
A'
Pbg
Pko
Pkl
Pwg
Pgz
Pg
Pgr
Pdi
Pgn
Pmg
Pms
Pif
Pvn
Pvu
Agr
Avo
Agn
Opc
Cu
Pbg
Pko
Pkl
Pwg
Pgz
Pg
Pgr
Pdi
Pgn
Pmg
Pms
Pif
Pvn
Pvu
Agr
Avo
Agn
Opc
Cu
Pbg
Pgr
Pvu
Pgr
Pvu
Pgr
Pvu