PREPARED IN COOPERATION WITH THE
MICHIGAN DEPARTMENT OF CONSERVATION, GEOLOGICAL SURVEY DIVISION
AND WISCONSIN GEOLOGICAL AND NATURAL HISTORY SURVEY

E X P L A N A T I O N

Lithologic descriptions are mainly as in references cited, but a few have been modified to be more generally applicable

Upper Precambrian — Keweenawan Series

db — Diabase
Rare dikes. Fine to medium grained

gd — Fine-grained greenstone
Dark green, generally well-foliated rock; age unknown

hgr — Hoskin Lake Granite
Mainly light colored, massive, medium- to coarse-grained granite with large rectangular phenocrysts of microcline and oligoclase

mqd — Marinette Quartz Diorite
Gray to black medium-grained rock, generally massive but locally foliated

mg, md — Metagabbro and metadiabase
Dikes and sills. Massive, dark-gray to green, medium- to coarse-grained rock
mg, *metagabbro dikes and sills*
md, *metadiabase dikes and sills*

gr, peg, di — Igneous rocks
gr, *Granite dike*
peg, *Pegmatite*
di, *Diorite*

ppc — Peavy Pond Complex
Chiefly hornblende metagabbro, but includes metanorite, metatonalite, granodiorite, and granite

Middle Precambrian — Animikie Series — Paint River Group

pf — Fortune Lakes Slate
Mainly sericitic slate with interbedded graywacke. Includes some sideritic slate and probable iron-formation. In Wisconsin indicates post-Riverton undifferentiated

ps — Stambaugh Slate
Cherty laminated rock, flinty magnetic slate, chlorite slate, local graywacke

ph — Hiawatha Graywacke
Mostly massive graywacke and dark-gray slate, commonly sideritic. Lowermost part typically a chert breccia

UNCONFORMITY

pr — Riverton Iron-Formation
Thin-bedded rock, mainly chert and siderite where unoxidized but includes some graphitic and sideritic slate, stilpnomelane beds, and magnetite-bearing rock locally. In most places original iron minerals are oxidized to reddish to yellowish iron oxides

pd — Dunn Creek Slate
Chiefly siltstone and sericitic slate but uppermost part of formation is graphitic pyrite slate; in eastern Iron County lowermost part of formation is black cherty slate, sideritic slate, and locally chert-siderite rock

pu — Paint River Group, undivided

Baraga Group

bb — Badwater Greenstone
Massive chloritized basic volcanic rocks, in part flows with ellipsoidal structures, in part tuffs and agglomerates

bm, bmq — Michigamme Slate
Mainly graywacke and slate or more highly metamorphosed equivalents. Upper part poorly known but probably contains black slate, quartzite, and locally magnetic iron-formation, possibly some volcanic tuffs and flows
bmq, *vitreous quartzite and quartzitic conglomerate*

UNCONFORMITY

ba — Amasa Formation
Chiefly martite slate with layers of cherty iron-formation

bf — Fence River Formation
Fine-grained magnetite-bearing quartzite and massive garnet-grunerite schist

bh, bhb, bhm, bhmi — Hemlock Formation
Massive chloritized basic volcanic rocks, in part flows with ellipsoidal structures, in part agglomerate and tuff.
bhb, *Bird Iron-Bearing Member*
bhm, *Mansfield Iron-Bearing Slate Member*
bhmi, *iron-formation*

bg — Goodrich Quartzite
Mostly ferruginous quartzite, predominantly clastic but commonly cherty; locally contains chert grains or platy fragments of an oolitic iron-formation

UNCONFORMITY

Menominee Group

mv — Vulcan Iron-Formation (Central Dickinson County)
Thin-bedded rock. Iron-rich layers composed of magnetite, martite, specularite, and grunerite alternate with quartz-rich layers

Vulcan Iron-Formation (Southern Dickinson County)

mvc — Curry Iron-Bearing Member
Layers composed of hematite, minor magnetite, and some quartz alternate with layers composed of red jasper granules, hematite-magnetite, and quartz (meta-chert). Overlain by Loretto Slate Member; ferruginous siliceous slate or schist, very thin and local, not shown on map

mvb — Brier Slate Member
Laminated siliceous ferruginous slate

mvt — Traders Iron-Bearing Member
Layers composed of hematite, minor magnetite, and some quartz alternate with layers composed of red jasper granules, hematite-magnetite, and quartz (meta-chert)

mvu — Vulcan Iron-Formation, undivided

mf — Felch Formation
In central Dickinson County, mica schist with thin quartzite layers. In southern Dickinson County thin-bedded sericitic slate and phyllite with thinly interbedded quartzite in belt from Iron Mountain to Waucedah; thick-bedded quartzite, conglomerate, and breccia in belt from Lake Antoine to Loretto

UNCONFORMITY

Chocolay Group

cr — Randville Dolomite
In eastern Iron County: mainly fine- to medium-grained dolomite commonly with clastic quartz; thin layers of quartzite, arkose, slate, and schist. In central Dickinson County: mostly massive dolomite, coarsely crystalline with abundant silicates in Felch and Calumet areas, fine grained elsewhere. In southern Dickinson County: mostly massive dolomite composed of detrital dolomite and quartz grains, and thick-bedded crystalline dolomite; associated sandy dolomite and algal dolomite

cs — Sturgeon Quartzite
Vitreous quartzite; in central Dickinson County mostly massive but schistose in lowermost and uppermost parts, in southern Dickinson County mainly flaggy to thick bedded but sericitic quartzite and schist in lowermost part

cf — Fern Creek Formation
Mostly conglomerate; some arkose, argillite, sericitic schist, quartzite, and possible tillite

csa — Saunders Formation
Massive dolomite or silica rock probably formed at erosion surface on dolomite

PRECAMBRIAN

p€u — Precambrian rocks, undivided

Lower Precambrian — Dickinson Group

UNCONFORMITY

gg, clg — Granite gneiss
gg, *Pink to gray, well foliated, locally porphyritic. Some dark gneiss and abundant masses of amphibolite.*
clg, *Carney Lake Gneiss, mainly irregularly streaked gray and red composite, but also well foliated gray variety and minor weakly foliated red variety. Inclusions of amphibolite, biotite schist, quartz-biotite schist, and quartzite*

bgg — Banded gray gneiss
Well foliated granitic rock with layers of amphibolite. Locally cut by small pegmatite dikes

dsm — Six-Mile Lake Amphibolite
Massive, fine- to medium-grained, dark-colored hornblende-plagioclase rock. Locally cut by small pegmatite dikes

ds, dsk — Solberg Schist
Mainly dark hornblendic and biotitic schists.
dsk, *Skunk Creek Member, contains thin interbedded magnetite-rich layers*

deb — East Branch Arkose
Mostly massive light-colored arkose with thick beds of conglomerate, also metavolcanic flows and tuffs

UNCONFORMITY

gn — Granite gneiss
In part, red augen gneiss; in part, pink, fine to medium grained

du — Dickinson Group, undivided

rg — Porphyritic red granite
Massive, coarse granite with large microcline augen. Age uncertain relative to other lower Precambrian rocks

hg — Hardwood Gneiss
Complex of metamorphosed volcanic, sedimentary, and mafic igneous rocks. Age unknown; may be essentially part of Dickinson Group

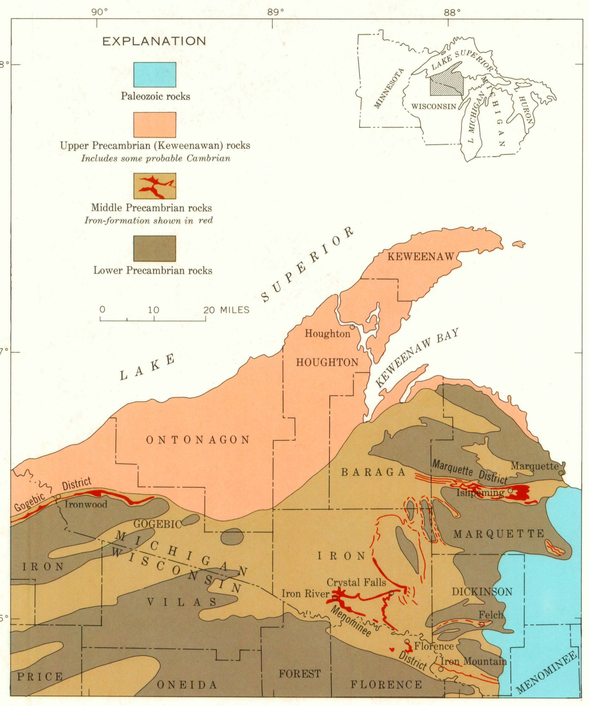
qfv, qmv — Quinnesec Formation
qfv, *Felsic metavolcanic rocks, generally gray, well foliated, fine grained, phenocrysts of quartz or plagioclase or both.*
qmv, *Mafic metavolcanic rocks, altered basaltic flows, some ellipsoidal. Massive and foliated greenstone, chlorite schist, hornblende schist, amphibolite, and hornfels. Local intercalations of biotite schist, magnetic iron-formation, impure quartzite, and arkose not shown on map*

gs — Greenstone along Brule River
Massive metabasalt, locally agglomeratic and ellipsoidal. Relative age unknown

mc — Margreson Creek Gneiss
Mainly granitic rocks generally foliated and gneissic. Pink to gray, medium to coarse grained, equigranular to inequigranular with large tabular somewhat alined crystals of microcline and albite

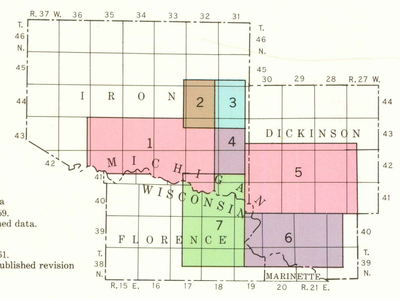
Contact

Fault
U, *upthrown side;* D, *downthrown side*

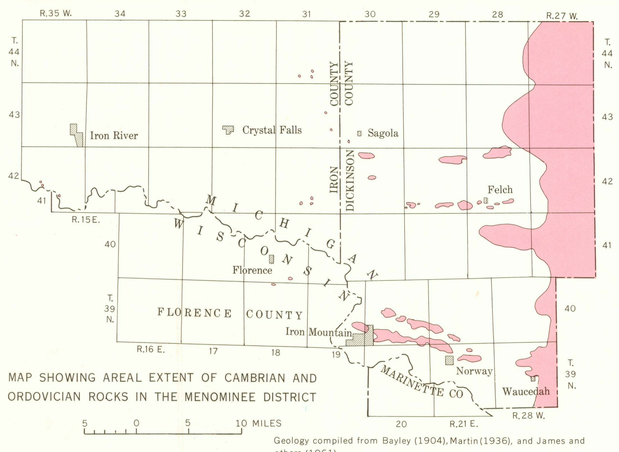


Geology modified from Leith, Lund, and Leith, 1935

GENERALIZED GEOLOGIC MAP OF NORTHERN MICHIGAN AND WISCONSIN SHOWING LOCATION OF THE MENOMINEE IRON-BEARING DISTRICT



Sources of data
1. James and others, 1959.
2. Wier, K. L., unpublished data.
3. Gair and Wier, 1956.
4. Bayley, 1959.
5. James and others, 1961.
6. Bayley, 1957, and unpublished revision
7. Dutton, 1966.



MAP SHOWING AREAL EXTENT OF CAMBRIAN AND ORDOVICIAN ROCKS IN THE MENOMINEE DISTRICT

Geology compiled from Bayley (1904), Martin (1936), and James and others (1961)

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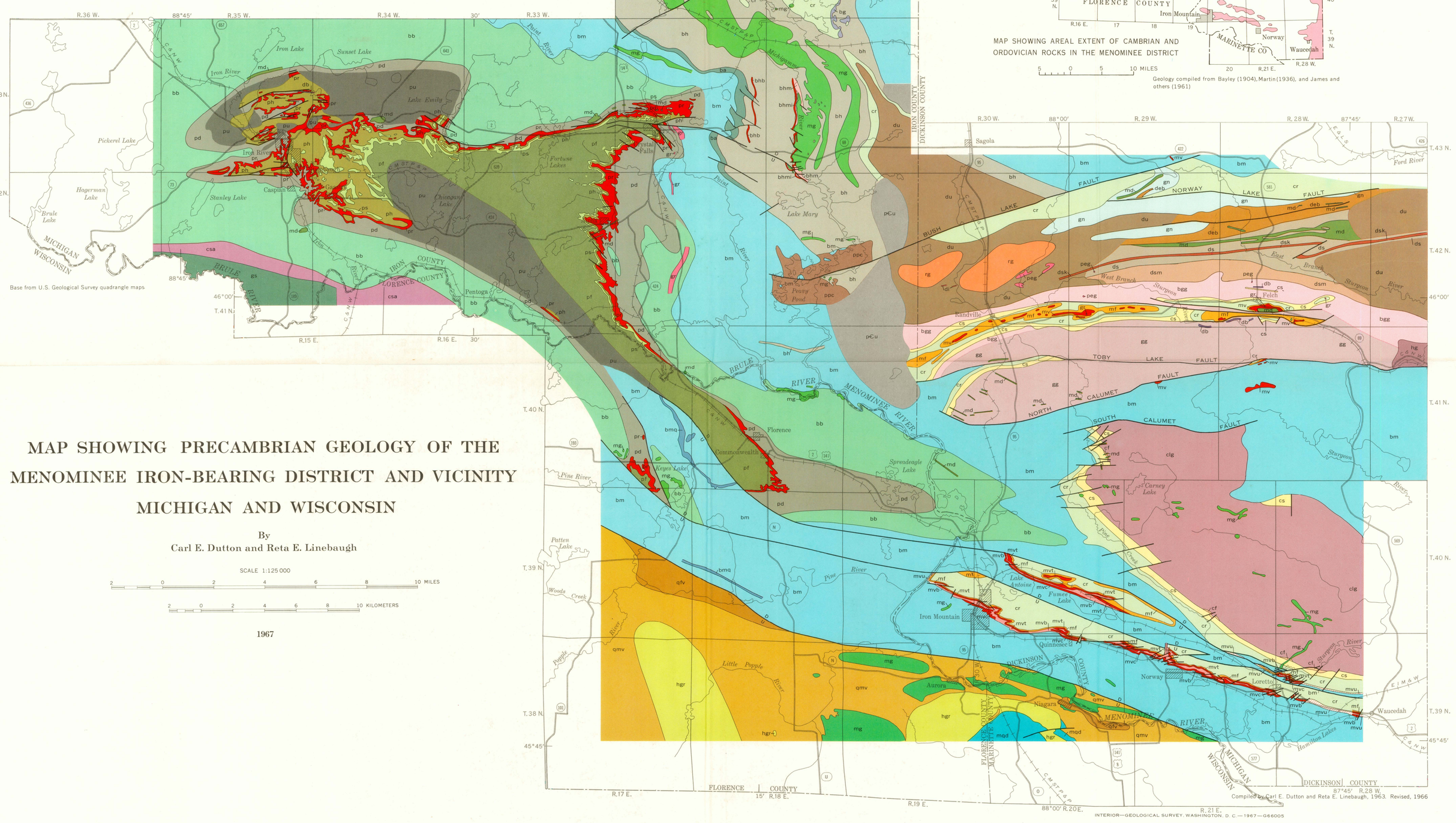

Base from U.S. Geological Survey quadrangle maps

Compiled by Carl E. Dutton and Reta E. Linebaugh, 1963. Revised, 1966

MAP SHOWING PRECAMBRIAN GEOLOGY OF THE MENOMINEE IRON-BEARING DISTRICT AND VICINITY MICHIGAN AND WISCONSIN

By
Carl E. Dutton and Reta E. Linebaugh

SCALE 1:125 000

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1967

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