

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Preliminary Quaternary Geologic Map of the
Spooner Quadrangle, Northwestern Wisconsin

by
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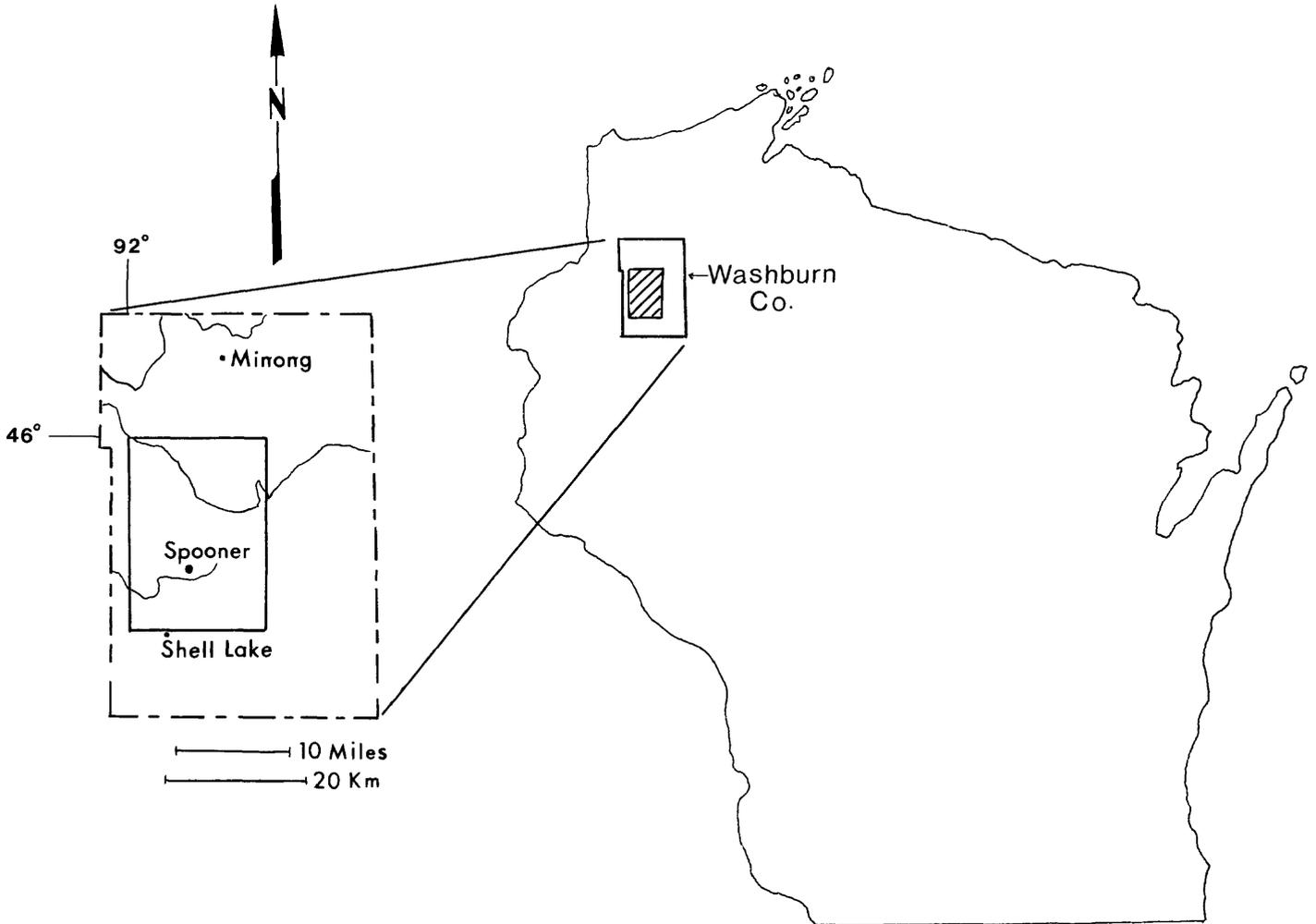
Open-File Report Map ~~84-235~~
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This report is preliminary and has not been edited or
reviewed for conformity with Geological Survey
standards and nomenclature

¹Menlo Park, California

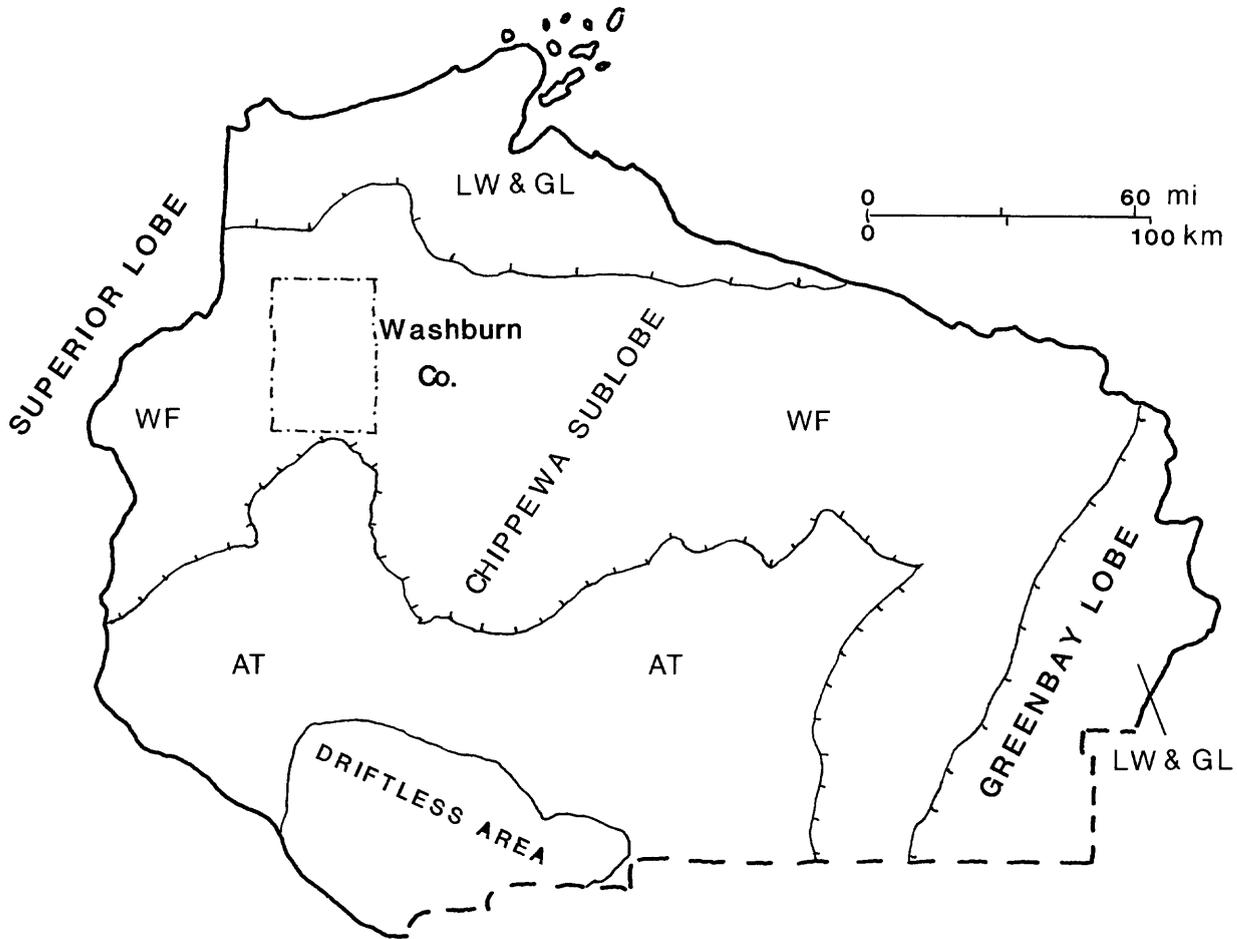
1985

INDEX MAP



Location of Spooner Quadrangle in Washburn county, Wisconsin

GLACIAL DEPOSITS OF NORTHERN WISCONSIN - Map shows major lobes and sublobes of last major ice advance and corresponding outer limit of end moraines (tick marks on up-ice side). Modified after Thwaites, 1956; and Mickelson and others, 1983.



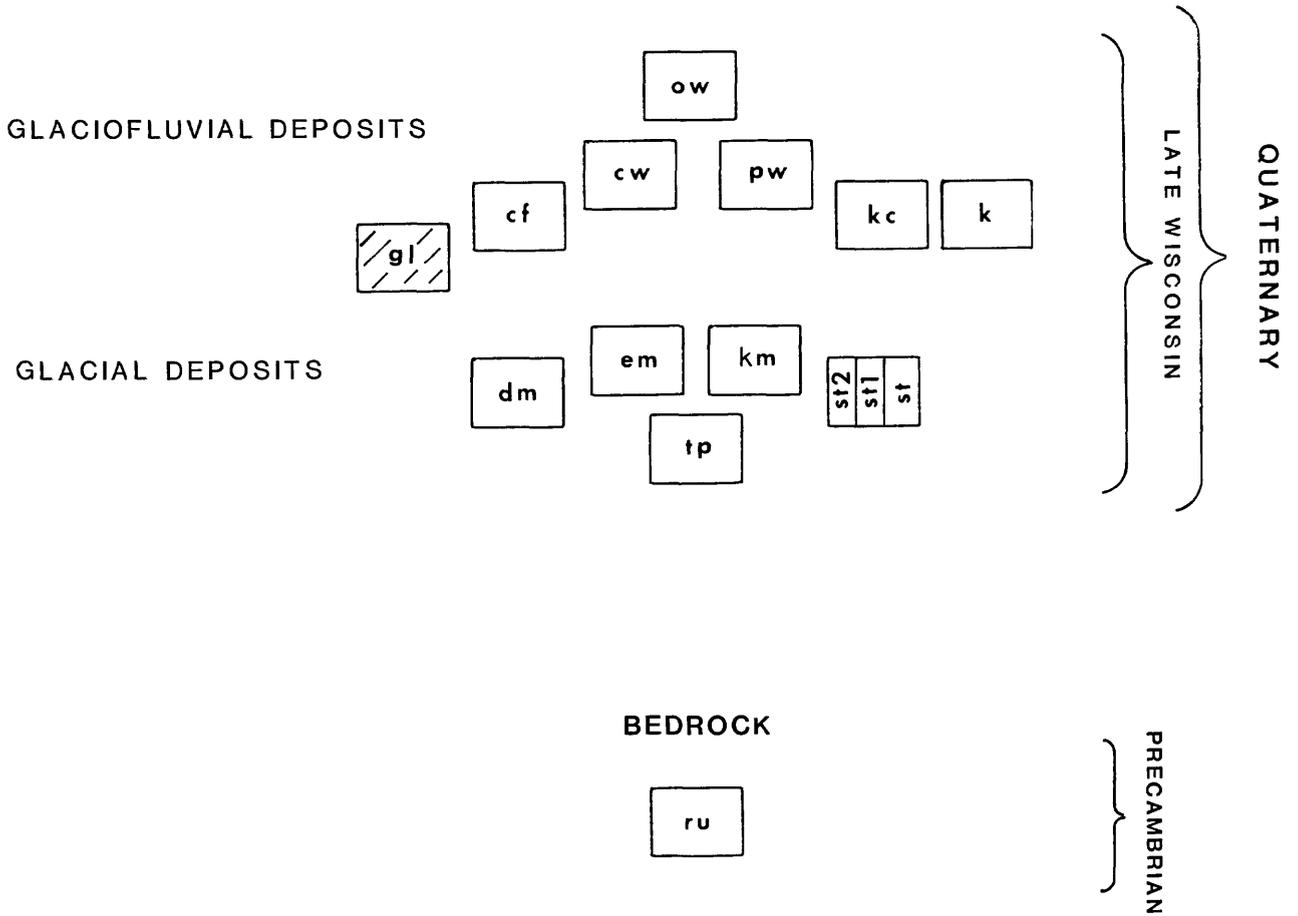
EXPLANATION

Time-Stratigraphic Units	Age of Drift in N Wisconsin
GL - GREATLAKEAN	10,000 - 12,000
LW - LATE WOODFORDIAN	12,000 - 13,000
WF - WOODFORDIAN	13,000 - 15,000
AT - ALTONIAN	22,000 or older

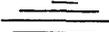
years before present

EXPLANATION

CORRELATION OF MAP UNITS



MAP SYMBOLS

-  Contact - dashed where indefinite
-  Melt-water channel, arrow indicates direction of flow
-  Drumlinoid hill, arrow indicates direction of ice movement
-  Kame and kame complex
-  Collapsed basin
-  Lake

DESCRIPTION OF MAP UNITS

GLACIOFLUVIAL DEPOSITS

ICE-CONTACT DEPOSITS

- kc KAME COMPLEX -- Moderatly to poorly sorted, stratified to locally nonstratified sand and gravel, with larger cobbles and boulders common. Deposits range from coarse sand, to bouldery sandy gravel. Clasts generally subrounded to subangular. Some deposits may have thin capping of till. Deposits occur as irregular shaped to elongated steep sloped mounds up to 100 feet (30 m) in height
- k KAME -- Boulder-bearing stratified sand and gravel. Deposits form semicircular to oval shaped mounds, with steep slopes and conical or ridge-like upper parts, that reach 80 feet (24 m) in height
- cf CHANNEL FILLING (Esker Deposits) -- Coarse sand and gravel, with large cobbles and boulders. Forms narrow elongated mounds and short steep ridges that are semiparallel to ice flow
- cw COLLAPSED PITTED OUTWASH -- Mainly moderately sorted, stratified sand and pebbly gravel. Locally is poorly sorted and stratified. Large cobbles and boulders uncommon. Clast generally rounded to subrounded. Partially covered by aeolian sand deposits. Forms low relief terrain of irregular mound and kettle topography with some flat plains, and contains numerous kettles, hollows, lakes, springs, marshes, and irregular shaped knobs and discontinous ridges. Surface is well drained internally but lacks integrated drainage system. Contains a few meandering spring- or lake-fed streams of low gradient. Local relief is 10-50 feet (3-15m)
- pw PITTED OUTWASH -- Chiefly moderatly sorted, stratified sand and fine gravel. Forms low relief areas with flat ground. Surface is well drained with some kettles, marshy depressions and channal scars, but lacks integrated drainage. Local relief is 5-20 feet (2-6m)

PROGLACIAL DEPOSITS

- gl GLACIOLACUSTRINE DEPOSITS -- Clay-silt-sand deposits with scattered mounds of ice-contact deposits. Forms a low relief and poorly drained terrain of extensive swampy areas, broad rolling ground and flatland. Shallow lakes are common. Includes Holocene marsh deposits (organic debris, peat, and humis-rich sand-silt deposits)
- ow OUTWASH -- Largely sorted sand and gravel that forms very low relief terrain of flat to gently undulating ground

GLACIAL DEPOSITS

LODGEMENT TILL

- st HIGH RELIEF GROUND MORaine -- Chiefly nonsorted to poorly sorted, nonstratified, compacted clay-bearing bouldery sandy till and gravelly till, clay-rich locally. Sporadic cover of ablation till is indicated by presence of disintegration features (pits and knobs). Forms moderate relief terrains of undulating ground, flats, hills, and locally hummocky topography. Typically contains kettles, swampy depressions, irregular shaped mounds, and drumlinized ground forms. Local relief is 20-100 feet (6-30m). st1 - includes some glaciofluvial deposits. Terrain shows integrated dentritic like (coarse textured) drainage pattern indicative of thick older till or drift, or fine-textured till. st2 - contains ice-contact deposits, and numerous kettles and small kettle lakes. Some large boulders with striated surfaces present.
- tp LOW RELIEF GROUND MORaine -- Well-compacted drumlinized till with minor ablation till and glaciofluvial sediments. Exhibts streamline features that parallel direction of ice flow

ABLATION TILL

- dm STAGNATION MORaine -- Bouldery sandy and loamy tills, clay-rich locally. Forms upland areas of low to moderate relief with hummocky topography. Irregular terrain with multibasinal drainage, that contains numerous knobs, kettle lakes, dry kettles, and kettle swamps. Lakes typically small and deep. Disintegration ridges present, distinguished by linear and arcuate alignment of knobs and kettles. Local relief is 20-80 feet (6-24m).

km KAME MORaine COMPLEX -- Mixture of till and glaciofluvial sediments. Till is typically poorly sorted, clay-bearing gravelly sand and sandy loam, with large cobbles and boulders common. Glaciofluvial deposits are mainly well stratified, coarse sands, gravelly sands, and boulder-bearing deposits. Forms highland areas (1120 to 1376 feet) of relatively high relief with distinct but irregular hills and ridges. Contains few kettles and kettle lakes. Internal drainage with some gullying along outer margins. Local relief is 120-220 feet (36-67m)

em END MORaine -- Deposits are mixtures of boulder bearing till and glaciofluvial sediments. Occur as distinct broad northeast and east-west trending mounds and ridges, that rise 100 feet (30m) or less in height. Most show steeper slopes on up ice (North) side, and flattish to rounded tops

GLACIAL FEATURES

DRUMLINOID HILLS -- Oval shaped to elongated mounds (parallel to ice flow), 20 to 80 feet (6-24m) in height

MELT-WATER CHANNEL -- Former drainage channels filled in with outwash sand and gravel, and some till. Typically occur along or near edges of end moraines. Contain spring fed streams

COLLAPSED BASIN -- Depressional feature in west central edge of quadrangle that contains numerous kettles and small lakes, and surrounded by ridges of ice-contact drift

mp MORaine PLATEAU -- Rounded steep-sided mound of probable inverted lake or outwash plain origin

BEDROCK

ru BEDROCK UNDIVIDED -- Outcrops of PreCambrian metasedimentary rocks locally covered by thin mantle of till

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