



EXPLANATION

Recent

- Swamp deposits (Post and preglacial; includes some swampy tracts with little or no post or preglacial drift)
- Alluvium (Includes some post and preglacial; some here or nearby have rock on Mississippi and Minnesota River bottoms)
- Dune sand (Fine sand-blown sand; includes much land on which there are no wind-blown deposits)
- Beach sand and gravel (Deposited along shores of glacial lakes, principally glacial Lake Agassiz, in the western and northern parts of the State)
- Lacustrine clay (Deposited in glacial lakes, principally in glacial Lake Agassiz, in the western and northern parts of the State. That in Lake Itasca and Lake Superior, includes the sandy deltas and alluvium of tributary streams)
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- Glacial till (Clayey and stony till which was submerged and associated with waters of glacial lakes, principally of Lake Agassiz, in the western and northern parts of the State)
- Glacial River Warren (Outlet of glacial Lake Agassiz. Channel formed with alluvium, containing some and possibly some of glacial Minnesota drift. Deposited in places where the river crossed the Wisconsin stage of glaciation)
- Terminal moraine of the Keweenaw ice (Includes those of the Ice-Maine lobe and of the Greenbush sublobe and occasional moraine drift. Composed of gray drift and includes, in places, other moraine or rock drift associated with gray drift moraine deposited in lakes, excepted, K, K₁, K₂, isolated gravel hills)
- Ground moraine of the Keweenaw ice (Includes the Ice-Maine lobe and the Greenbush sublobe, composed of young gray drift. Approximate outer limit of ice of the Wisconsin stage indicated by line of crosses)
- Terminal moraine of the Superior lobe of the Labrador ice (Composed of young reddish drift)
- Outwash sand and gravel (Associated with formation of moraines of Keweenaw, Patuxent, and Superior stages)

QUATERNARY

Wisconsin stage

- Recent
- Patuxent stage
- Illinoian stage
- Keweenaw stage

CONTINUED

- Moraine of Patuxent red drift, overlain by thin gray drift (The rest of the Patuxent moraine having been overridden, but not destroyed, by the Keweenaw ice of the Wisconsin stage)
- Red glacial drift (Mostly ground moraine; includes that deposited by the Patuxent ice sheet and the Superior lobe of the Labrador ice)
- Terminal moraine of the Patuxent ice sheet (Composed of young red till containing few lacustrine pebbles)
- Lens (Fine buff till lens, mainly undisturbed)
- Loam drift (Gray drift of Keweenaw ice sheet in northeastern Minnesota, correlated with loam drift of northeastern Iowa)
- Illinoian drift (Old red drift of the Patuxent ice sheet, locally referred to the Illinoian stage of glaciation)
- Keweenaw drift (Old gray drift of the Keweenaw ice sheet, partly overlain by loam drift in western Minnesota. Keweenaw, indicated by line of crosses)
- Rock outcrop (Tracts where bedrock is bare or but thinly or partly covered. Paleozoic rocks (P); Pre-Cambrian rocks (R) not completely mapped)
- Approximate eastern limit of glacial drift in north-eastern Minnesota
- Glacial strike (Indicates strike along direction of surface ice movement, solid lines of late movements)
- Esker

(Continued at right)

Base is U. S. Geological Survey 1:500,000 scale map of 1911 as engraved by Minnesota Geological Survey
 Contours compiled by Frank Leverett from the best available sources.

MAP OF THE SOUTHERN PART OF MINNESOTA SHOWING SURFICIAL DEPOSITS
 By Frank Leverett and Frederick W. Sardeson

