DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

MISCELLANEOUS FIELD STUDIES
MAP MF-1862

PRELIMINARY MAP SHOWING THE THICKNESS OF GLACIAL DEPOSITS IN OHIO

By
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This map was compiled as part of a U.S. Geological Survey project to portray the character and thickness of glacial deposits east of the Rocky Mountains. It is a preliminary map, compiled at a scale of 1:250,000 from sources of differing type and quality (fig. 1, table 1). County drift-thickness maps produced by the Ohio Geological Survey are the most reliable source of data used. These county maps, either published or in manuscript form, were available for 36 of the 72 counties that contain glacial or glacially related deposits more than 50 ft thick. An earlier, reconnaissance drift-thickness map of northwestern Ohio (Ohio Department of Natural Resources, 1960) provided data for parts of 12 additional counties. Published maps of bedrock topography were utilized for 9 counties and for parts of 6 counties. The computation of drift thickness in these counties is less reliable than the drift-thickness maps published by the Ohio Geological Survey because the bedrock topography maps, most of which are at least 20 years old, were compiled from a more limited set of data. In the remaining counties, only well-log data were available. Drift-thickness data in these counties are the least reliable; the determination of thickness trends was commonly guided by the configuration of preglacial drainage channels (as drawn by Stout and others, 1943) and by topography.

Throughout the glaciated areas of Ohio, and especially near the glacial margin, a network of drainage channels is buried by glacial drift. Some of these channels are of a preglacial age while others were formed during interglacial periods; some were cut into the bedrock by rivers—either preglacial rivers or meltwater streams flowing along the glacial margin—while others, such as the lower Cuyahoga River valley, may have been overdeepened by the erosive power of glacial ice. The thickest deposits of drift in the state occur in the lower Cuyahoga River valley near Lake Erie, and above the buried valley in west-central Ohio that has been historically considered a part of the Teays Valley. The thickest drift reliably measured in Ohio to date is 602 ft in a drill hole near Cleveland.

In contrast to the extreme variations in drift thickness encountered in the vicinity of buried channels, drift on the upland areas is generally thinner and the variations in thickness are much less pronounced. Worthy of note, however, are three large areas where the drift sheet is relatively thick. In northwestern Ohio, a large volume of drift was deposited along the flanks of the Erie ice lobe (fig. 2) near the interlobate position with the Saginaw lobe to the northwest; drift thickness there exceeds 200 ft. Thick drift was also deposited in a roughly east-west band across the Miami lobe. The mechanism that produced this band of thick drift is not obvious, but it may have been influenced in part by bedrock topography. Bedrock control of drift thickness is more clearly indicated to the east of Columbus, along the eastern flank of the Scioto lobe, where ice flow was resisted by rocks of the Allegheny plateau. The edge of the plateau, or the Allegheny escarpment, is obscured by glacial deposits but its likely position (Fenneman, 1938; Stout and others, 1943; Dove, 1960; and Root and others, 1961) is shown on the map. Southward from the ice margin's reentrant position in southern Richland County, ice flowing eastward from the Scioto lobe encountered the topographically higher plateau, which constrained the ice and caused drift to accumulate in significant thicknesses just to the west of the escarpment.

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_____1960f, Upper Miami River basin, underground water resources: Ohio Division of Water, Water Plan Inventory.

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Table 1.—*Identification of data sources, by county*

[Summary reports by Stout and others (1943) and Cummins (1959) were also used in the compilation of this map]

County	References used
Adams	S.L. Weisgarber, Ohio Geological Survey, Columbus, written commun., 1985
Allen	Ohio Department of Natural Resources (1960)
Ashland	Risser (1976)
Ashtabula	Risser (1984)
Auglaize	Ohio Department of Natural Resources (1960), Schmidt (1960), Walker (1959)
Brown	Leow (1985a)
Butler	Leow (1985b)
Champaign	Norris and Spicer (1958), Risser (1979)
Clark	Norris and others (1952), Norris and Spicer (1958)
Clermont	S.L. Weisgarber, Ohio Geological Survey, Columbus, written commun., 1985; Stout and others (1943)
Clinton	Teller (1967)
Columbiana	Vormelker (1985a)
Coshocton	Lamborn (1954)
Crawford	Swinford (1984a)
Cuyahoga	Vormelker (1978a)
Darke	Walker (1960a, 1960d, 1961a)
Defiance	Ohio Department of Natural Resources (1960)
Delaware	Vormelker (1982a)
Erie	Larsen (1984a); R.R. Pavey, Ohio Geological Survey, Columbus, written commun., 1986
Fairfield	Wolfe and others (1962)
Fayette	Stout and others (1943)
Franklin	Schmidt (1958)
Fulton	Vormelker (1972)
Geauga	Vormelker (1978b)
Greene	Norris and others (1950)
Hamilton	Vormelker (1985b)
Hancock	Ohio Department of Natural Resources (1960)
Hardin	Leow (1985c), Ohio Department of Natural Resources (1960)
Henry	Ohio Department of Natural Resources (1960)
Highland	Rosengreen (1974)
Holmes	Vormelker (1980)
Huron	Larsen (1984b)
Knox	Root and others (1961)
Lake	Vormelker (1974a)
Licking	Dove (1960), Forsyth (1966)
Logan	Forsyth (1967, 1968), Schmidt (1960, 1983), Walker (1960e, 1960f)
Lorain	Risser (1978); R.R. Pavey, Ohio Geological Survey, Columbus, written commun., 1986
Lucas	Bush (1966), Ohio Department of Natural Resources (1960)
Madison	Norris and Spicer (1958), Vormelker (1974b)
Mahoning	Risser (1975a)
Marion	Vormelker (1981a)
Medina	Risser (1975b)
Meeker	Kostelnick (1982), Ohio Department of Natural Resources (1960), Walker (1961b)
Miami	Schmidt (1984), Walker (1960a, 1960d)
Montgomery	Norris (1948), Norris and Spieker (1966), Spieker (1968), Walker (1960c, 1961a)
Muskingum	No data sources; only topographic criteria were used
Morrow	Vormelker (1981b)
Ottawa	Larsen (1984c)
Paulding	Ohio Department of Natural Resources (1960)
Perry	Flint (1951)
Pickaway	Ohio Division of Water (1965), Schmidt (1980)
Pike	Ohio Division of Water (1965)
Portage	Risser (1983)
Preble	Walker (1960b, 1960c, 1961a)
Putnam	Ohio Department of Natural Resources (1960)
Richland	Vormelker (1984a)
Ross	Ohio Division of Water (1965), Vormelker (1984b)
Sandusky	Larsen (1984d)
Scioto	Ohio Division of Water (1965)
Seneca	Vormelker (1981c)
Shelby	Kostelnick (1983), Walker (1960a, 1960f)
Stark	Delong and White (1963)
Summit	Vormelker (1975)
Trumbull	Vormelker (1982b)
Tuscarawas	Lamborn (1956)
Union	Forsyth (1967, 1968), Schmidt (1960, 1978)
Van Wert	Vormelker (1981d)
Warren	Weisgarber (1985)
Wayne	White (1967)
Williams	Ohio Department of Natural Resources (1960)
Wood	Bush (1966), Herker (1945), Ohio Department of Natural Resources (1960)
Wyandot	Swinford (1984b)

EXPLANATION

- 50 — Drift-thickness contour. Contours of 50 ft, 100 ft, 200 ft, and 400 ft are shown. Hachures indicate closed areas of lesser thickness
- 200+/50-100 — Implies closely spaced contours, with drift thickness increasing from less than 50 ft to more than 200 ft across the line indicated by arrow
- X—X — Allegheny escarpment
- Approximate position of preglacial and glacial valleys, collectively known as the Teays Valley
- Limit of late Wisconsinan deposits (from Goldthwait and others, 1961)
- Maximum limit of glaciation (from Goldthwait and others, 1961)

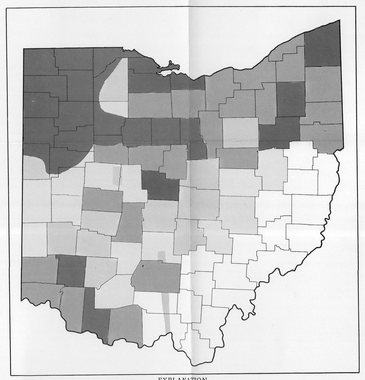

Figure 1.—Drift-thickness data sources. Reliability of data ranges from very good (published map of drift thickness) to relatively poor (well-log data and topographic criteria).

Figure 2.—Map showing the approximate positions of the Erie, Miami, and Scioto ice lobes (from Goldthwait and others, 1961).

Base from U.S. Geological Survey
Ohio State map, 1971

SCALE 1:500,000
1 inch equals approximately 8 miles
10 0 10 20 30 40 MILES
10 0 10 20 30 40 50 KILOMETERS

Lambert conformal conic projection
Contour interval 200 feet

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