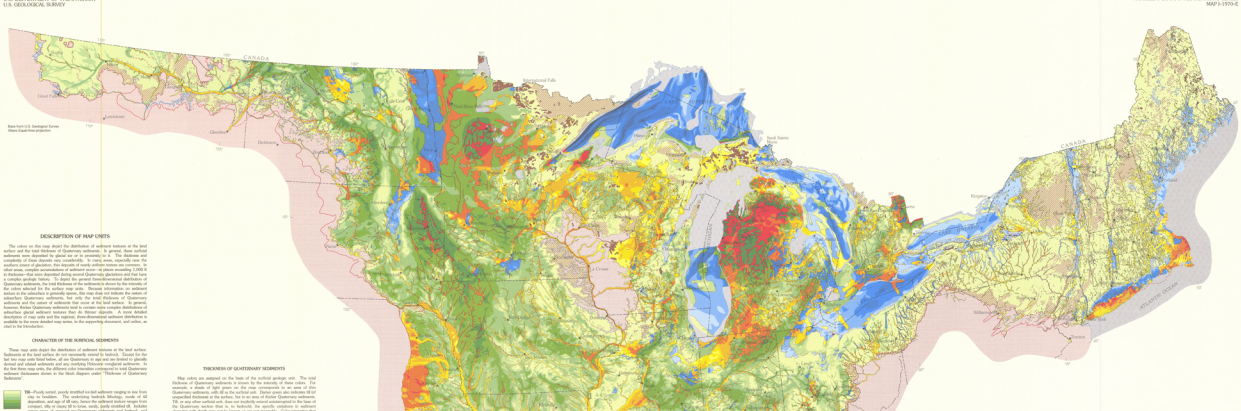
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

MISCELLANEOUS INVESTIGATIONS SERIES
MAP I-1970-E



MAP SHOWING THE THICKNESS AND CHARACTER OF QUATERNARY SEDIMENTS IN THE GLACIATED UNITED STATES EAST OF THE ROCKY MOUNTAINS

By

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DESCRIPTION OF MAP UNITS

The colors on this map depict the distribution of sediment texture at the land surface and the total thickness of Quaternary sediments. In general, these surficial sediments were deposited by glacial ice or in proximity to it. The thickness and texture of Quaternary sediments underlying the land surface, however, vary from surface extent of glaciation. Into deposits of nearly uniform texture are common. In other areas, complex accumulations of sediment occur—in places exceeding 1,000 ft (305 m) in thickness—that record the complex Quaternary glacial and nonglacial history. To depict the general three-dimensional distribution of Quaternary sediments, the total thickness of the sediments is shown by the intensity of their color, and the texture of the land surface is shown by the overprinted symbols. Sediment texture in the subsurface is generally coarser, this map does not indicate the nature of subsurface Quaternary sediments, but only the total thickness of Quaternary sediments. Most of the Quaternary sediments are thin, less than 50 ft (15 m) thick; however, thicker Quaternary sediments tend to contain more complex distribution of subsurface glacial sediment textures than do thinner deposits. A more detailed description of the geology of the Quaternary sediments underlying this surface is available in the more detailed map series, in the supporting document, and online, as cited in the Introduction.

CHARACTER OF THE SURFICIAL SEDIMENTS

These map units depict the distribution of sediment textures at the land surface. Sediments at the land surface do not necessarily extend to bedrock. Except for the first three map units, the different color intensities correspond to total Quaternary sediment thickness. The different color intensities correspond to total Quaternary sediment thickness. The first three map units, the different color intensities correspond to total Quaternary sediment thickness. Sediment thickness shown in the three diagrams under "Thickness of Quaternary Sediments"

Till—Poorly sorted, poorly stratified ice-laid sediment ranging in size from clay to boulders. The underlying bedrock lithology, mode of till emplacement, and age of the till influence the composition of the matrix (sand, silt, or clayey till to loam, sandy, poorly stratified till. Includes minor areas of exposed pre-Quaternary sediments and bedrock, and stratified deposits too small to map at this scale

Coarse-grained stratified sediment—Water-laid sediment, generally well sorted, ranging in size from sand to boulders. Includes minor areas of overlying Holocene alluvium, eolian sand, peatland beyond the limit of glaciation, and glacially related lake sediment beyond the limit of glaciation

Fine-grained stratified sediment—Water-laid, generally bedded or laminated silt and clay. Includes minor areas of overlying Holocene alluvium, sediment (commonly interbedded), deposited mostly in proglacial lakes, includes Holocene sand overlying fine-grained glacial sediment to the limit of glaciation, and glacially related lake sediment and peatland beyond the limit of glaciation. Unit does not include areas mantled by glacial lakes where the fine-grained, stratified lake sediments are not mappable

Organic-rich sediment—Peat, marsh, and bog deposits. Thickness of organic-rich sediment is not shown on this map. Organic-rich deposits are shown only where the total thickness of Quaternary sediments is less than 50 ft; elsewhere, the map color represents the deposits just below the organic-rich sediment and shows the total thickness of Quaternary sediments

Patchy Quaternary sediment—Areas characterized by numerous exposures of bedrock or outcrops of glacial till or colluvium not derived from glacial deposits. The proportion of complexed to glacial material ranges from numerous isolated exposures of bedrock in an area of thin till, to patchy, bedrock mantled by thin glacial deposits to areas of thick till with numerous bedrock exposures

Exposed bedrock, moraines, or alluvium or colluvium not derived from glacial deposits—Includes all of the longitudinal terrain (except glacially related coarse-text sediment) and those areas inside the limit of glaciation where Quaternary sediments are absent

Water areas where no geologic data are shown

EXPLANATION OF MAP SYMBOLS

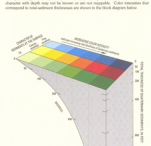
Contact between sediment units at the land surface—In places the contact between coarse-grained stratified sediment and bedrock represents an arbitrary limit of mapping of Quaternary deposits. Examples occur in Nebraska, in the Mississippi River valley south of Cape Girardeau, Mo., and near Sherman, Tx.)

Maximum extent of ice during late Wisconsinan time (the last major Pleistocene ice advance)—Position of this is uncertain in places, especially in parts of Nebraska and Texas

Maximum extent of ice prior to late Wisconsinan time—Age of ice is uncertain but is generally between about 130,000 and 1,000,000 years. Wisconsinan is early Pleistocene. In many places, boundary is defined by the presence of glacial erratics where till is absent

THICKNESS OF QUATERNARY SEDIMENTS

Map colors are assigned on the basis of the surficial geologic unit. The total thickness of Quaternary sediments is shown by the intensity of these colors. For the purposes of this map, the total thickness of Quaternary sediments is the total Quaternary sediments, will-all of the surficial unit. Darker green also indicates if did unspecified thickness at the surface, but is an area of thicker Quaternary sediments. The thickness of Quaternary sediments is not shown for the three surficial units of the Quaternary section (that is, in bedrock). For specific variations in sediment character with depth may not be known or are not mappable. Color intensities that correspond to total sediment thicknesses are shown in the first diagram below.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