U.S. Department of Interior
U.S. Geological Survey

Map showing surficial geology of the St. Louis 30X60 minute quadrangle

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1. USGS Reston, VA

INTRODUCTION:

This compilation map was produced as the first step in generating a surficial geologic map data base for the greater St. Louis, Mo. area. Work on this project was funded by the U.S. Geologic Survey's National Geologic Mapping Program. The goal of this program is to produce bedrock and surficial geologic maps on 1:100,000 scale metric topographic bases. The map is a compilation of existing data (Fig.1) of the surficial geology within the 30X60 St. Louis quadrangle. The map will be used in evaluating the existing data base and in delineating the problem areas for future research. Focus on future work in the St. Louis area will be on field checking existing data, refining stratigraphic correlation (Fig. 2) and, on subsurface characterization of the surfical materials.

DESCRIPTION OF MAP UNITS:

Qa-Alluvium (Holocene and Pleistocene((Wisconsinan))-Clay, silt, sand, gravel and boulders found in the floodplain of the present rivers and streams. May include wood and shell fragments. Thickness from less that 3 meters to greater than 25 meters (Goodfield, 1965; Willman and Frye, 1970). Unit includes Cahokia Alluvium of Willman and Frye (1970) and Frye and Willman (1975); alluvium of Goodfield (1965); and alluvial fill of Allen and Ward (1977).

Qf-Alluvial fan (Holocene and Pleistocene((Wisconsinan))-Poorly sorted sand and silt. Shown only where mapped as alluvial fan facies of Cahokia Alluvium (Lineback, 1979). Unit is found at the mouths of tributary streams along the Mississippi River in fan shaped deposits that intertongue with alluvium (Willman and Frye, 1970).

Qp-Peyton Colluvium (Holocene and Pleistocene((Wisconsinan))-Poorly sorted debris on lower slopes and slope bottoms that accumulated from slope wash, creep, mud and debris flows (Frye and Willman, 1975). May include some slump and landslide material (Lineback, 1979). Unit is not overlain by other formations and is separated from alluvium by vertical cutoffs (Willman and Frye, 1970).

Ql-Loess (Holocene and Pleistocene)-Massive bedded, yellow-tan to brownish-gray, fine sandy silt, silt and clay. Often contains fossil snail shells. Generally 3 to 25 meters thick. Unit is thickest along the edges of the major rivers. Unit includes Peoria Loess and Roxana Silt of Lineback (1979) and Willman and Frye (1979); Peoria Loess and Roxana Silt of Goodfield (1965); and Peoria Loess, Roxana Silt and Loveland Loess of Allen and Ward (1977). Unit is overlying bedrock and residuum derived from the bedrock.

Qhm-Mackinaw Member of the Henry Formation(Wisconsinan)-Evenly bedded sand and gravel derived from glacial outwash and deposited as valley train deposits in terraces and in present valley floors (Willman and Frye, 1970). Thickness from 10 to 30 meters.

Qtd-Terrace deposits (Pleistocene)-Lacustrine deposits of laminated sand, clay, and silt, with organic lenses and wood; thickness from 5 to 30 meters (Willman and Frye, 1970); fluvial deposits of silt, sand, and gravel, thickness from 10 to 40 meters (Goodfield, 1965; Allen and Ward, 1977). Deposits are limited to areas adjacent to rivers and streams. Although unit includes a number of both formal and informal terrace names, no attempt has been made to correlate across the map area. A recent summary of the difficulties and problems with terrace stratigraphy in the map area is found in Hajic, 1991.

Qt-Till (Pleistocene)-Heterogeneous mixture of clay, sand, gravel and boulders. Thickness 5 to 15 meters. Unit includes Vandalia Till Member of the Glasford Formation of Lineback (1979) and Willman and Frye (1970); Mill Creek Till of Goodfield (1965); and glacial till from Allen and Ward (1977). Till is overlain by loess and either rests on bedrock or residuum derived from the bedrock.

r-Residuum (Quaternary)-Clay, silt and sand with fragments of sandstone, chert, shale, dolomite and limestone depending on the lithology of the underlying bedrock. Material has been derived form in situ weathering of bedrock. Thickness from 1 to 10 meters. Unit includes residuum of Allen and Ward (1977) and Goodfield (1965).

b-Bedrock (Paleozoic)-Limestone, dolomite, sandstone and shale. Unit includes only areas shown as bedrock by Goodfield (1965).

EXPLANATION:

af-Artificial fill-Heterogeneous mixture of manmade and natural materials used as fill in construction, quarrying and road building. Natural material generally includes loess, soil, limestone and dolomite.

k-Karst-Topography that contains round to irregularly shaped depressions or sinkholes, cluster of sinkholes, cave openings, and solution pinnacles that formed from solution and (or) collapse of carbonate bedrock.

REFERENCES CITED:

Allen, W.H., Jr., and Ward, R.a., 1977, Soil in, The resources of St. Charles County, Missouri-land, water, and minerals: Missouri Geological Survey, Department of Natural Resources, Chapter 5, A., p. 107-145.

Frye, J.C., and Willman, H.B., 1975, Quaternary System, in, Willman, H.B., Atherton, Elwood, Buschbach, T.C., Collinson, Charles, Frey, J.C., Hopkins, M.E., Lineback, J.A., and Simon, J.A., Handbook of Illinois Stratigraphy: Illinois State Geological Survey Bulletin 95, p. 211- 239.

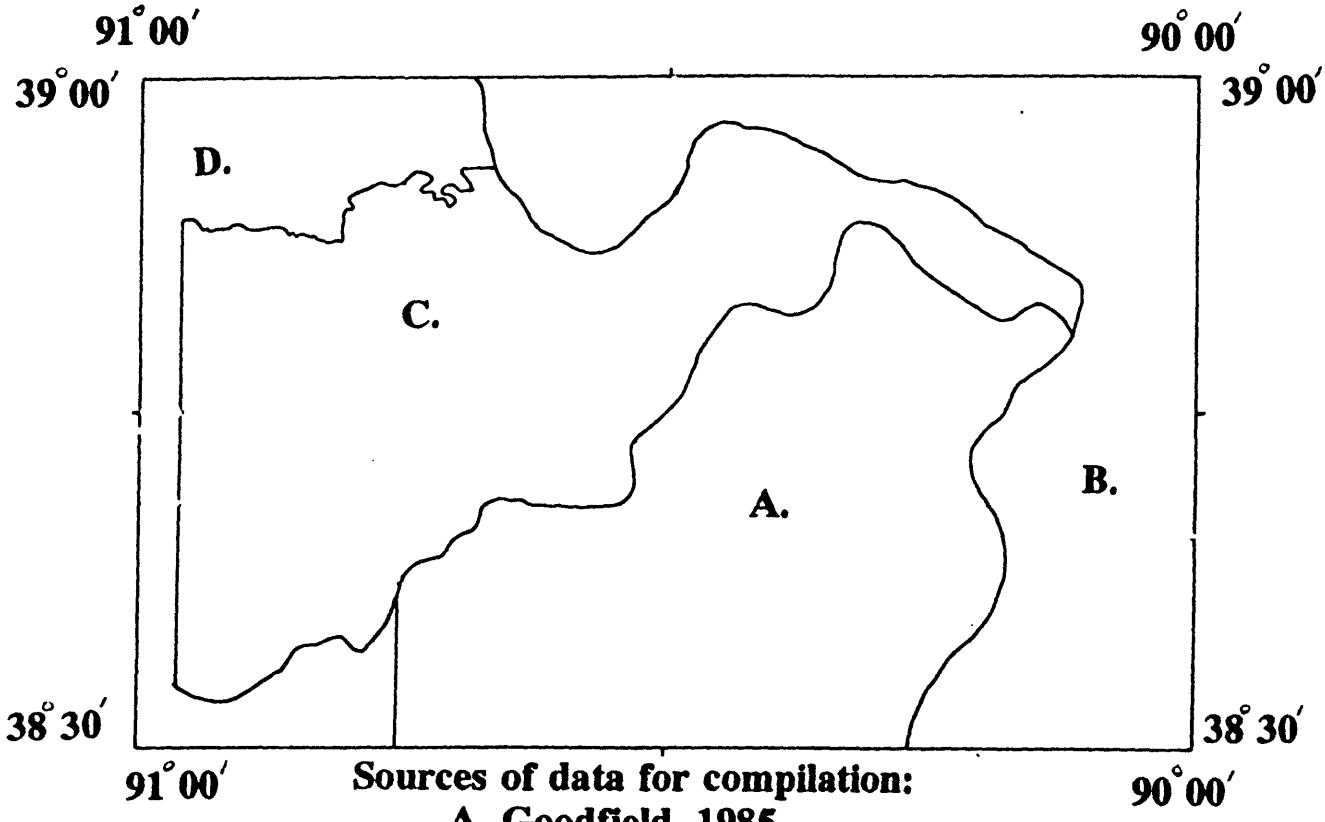
Goodfield, A.G., 1965, Pleistocene and surficial geology of the

City of St.Louis and the adjacent St.Louis County, Missouri: Urbana, Illinois, University of Illinois, Ph.D. dissertation, 207 p.

Hajic, E.R., 1991, Terraces in the central Mississippi Valley, in, Hajic, E.R., Johnson, W.H., and Follmer, L.R.,(trip leaders), Quaternary deposits and landforms, confluence region of the Mississippi, Missouri, and Illinois Rivers, Missouri and Illinois: terraces and terrace problems: Midwest Friends of the Pleistocene, 38th Field Conference, Department of Geology, University of Illinois at Urbana-Champaign, p. 1-32.

Lineback, J.A.(compiler), 1979, Quaternary deposits of Illinois: Illinois State Geological Survey Map, scale 1:500,000.

Willman, H.B., and Frye, J.C., 1970, Pleistocene stratigraphy of Illinois: Illinois State Geological Survey Bulletin 94, 204p.



Sources of data for compilation:

A. Goodfield, 1985.
B. Lineback, 1979.
C. Allen and Ward, 1977.
D. Schultz, unpublished data.

FIGURE 1

CORRELATION OF MAP UNITS

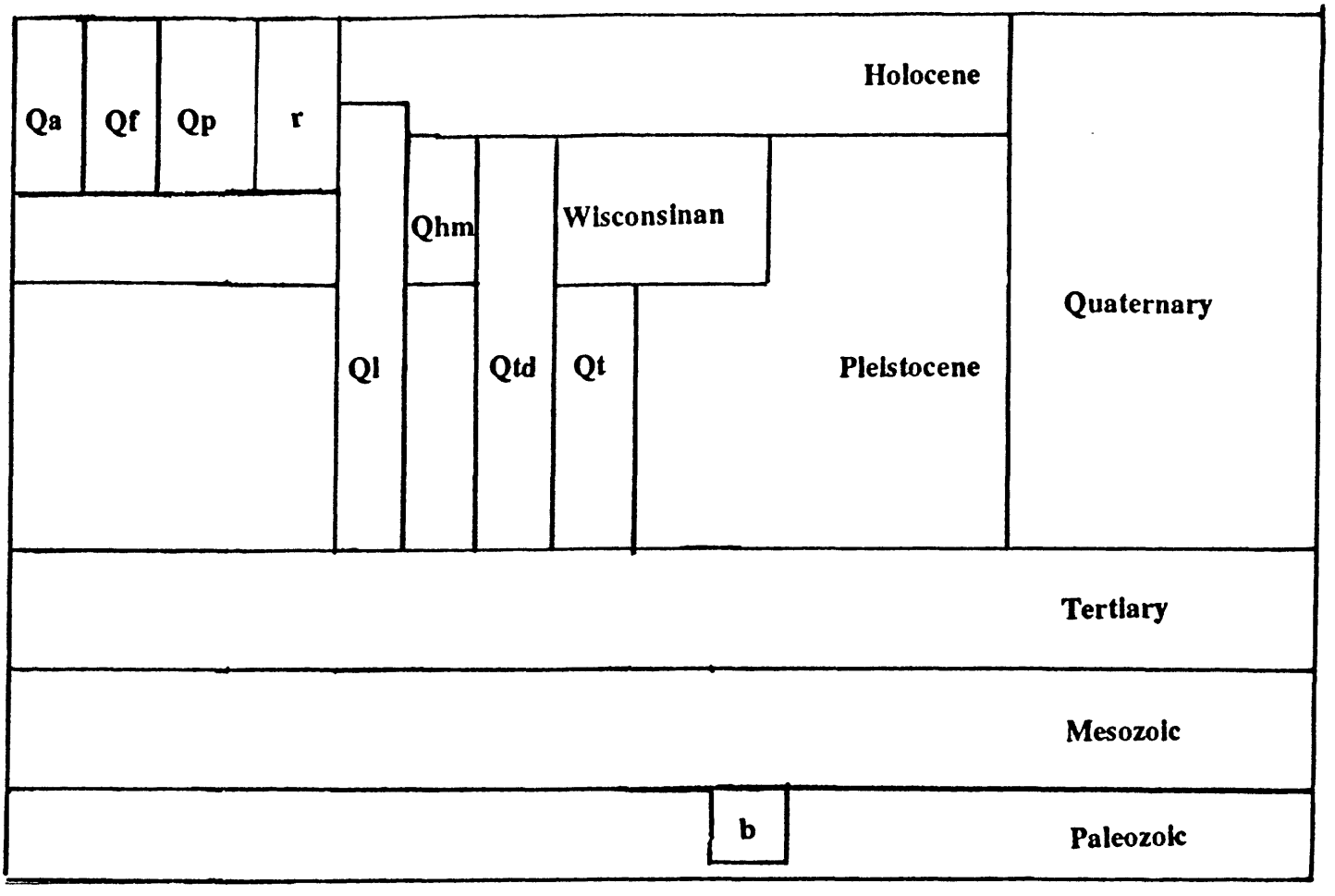


FIGURE 2