GLOSSARY

ALLUVIUM – Unconsolidated sediments deposited by streams

BEDROCK – Solid rock

CALCAREOUS – A rock containing some calcium carbonate ($CaCO_3$)

CHERT – A dense form of silica (SiO_2), that breaks into angular fragments

CLAYEY – Containing more than 40 percent clay-sized particles

COLLUVIUM – Mixed deposits of soil material and rock fragments that have accumulated near the base of slopes through soil movement, slides, and local wash

DOLOMITE – A rock composed chiefly of calcium magnesium carbonate [$CaMg(CO_3)_2$]

FLOOD PLAIN – Relatively flat narrow elongate areas bordering a stream where flooding occurs frequently or infrequently

LIMESTONE – A rock composed chiefly of calcium carbonate ($CaCO_3$)

LOAMY – Containing clay-, silt-, and sand-sized particles

OUTCROP – Exposure of bedrock

PARENT MATERIAL – The unconsolidated material from which soil develops

PARENT ROCK – Rock from which the parent materials of soil are formed

RESIDUUM – Material derived from weathering of rocks in place

SANDSTONE – A rock composed dominantly of particles ranging from 0.05 to 2.0 millimeters in diameter

SHALE – A rock composed dominantly of particles less than 0.002 millimeters in diameter

SHALY – Containing many fragments of shale

SILTSTONE – A rock composed dominantly of particles ranging from 0.002 to 0.05 millimeters in diameter

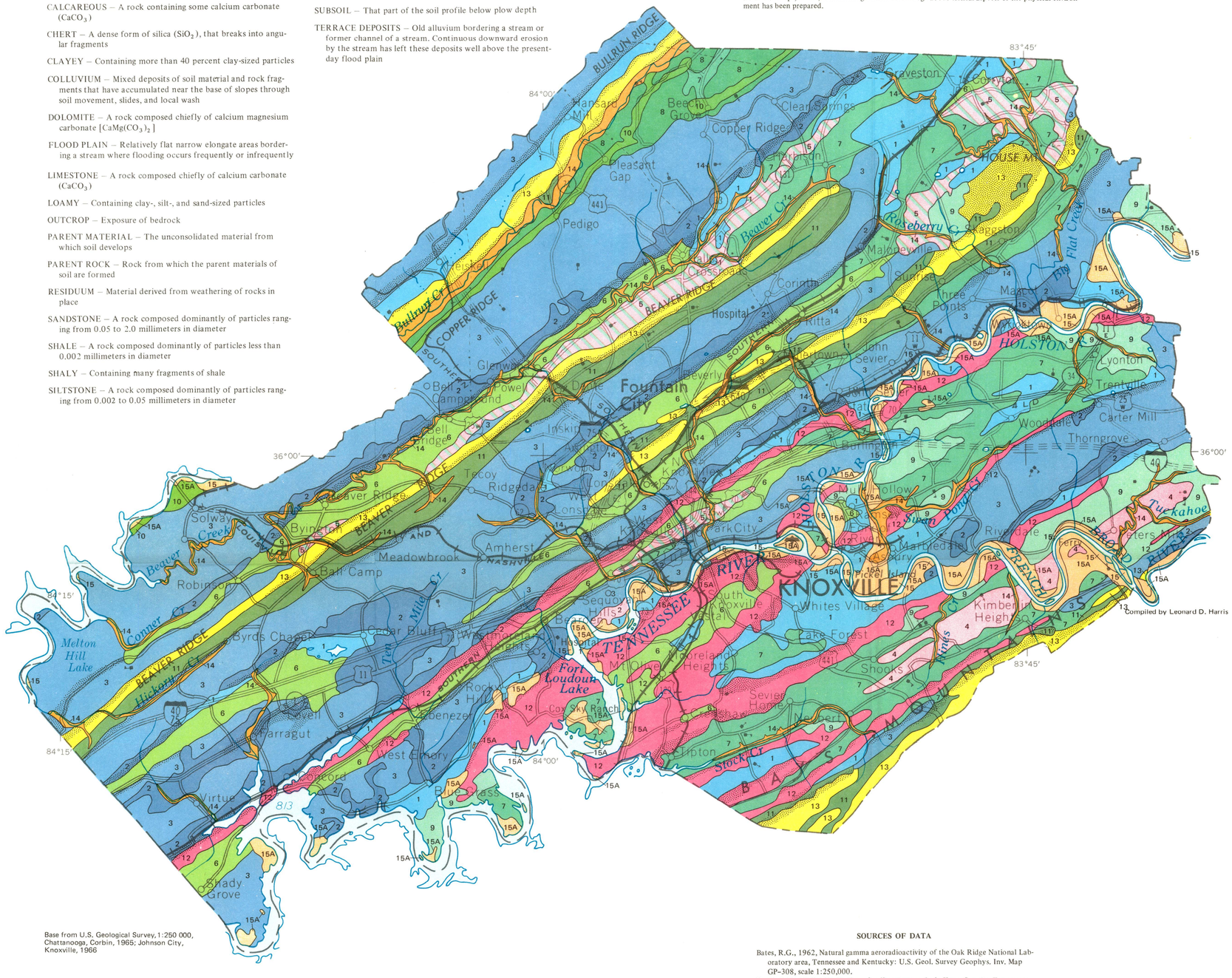
SOIL ASSOCIATION – A group of soils developed on similar parent materials and under similar climatic and topographic conditions

SUBSOIL – That part of the soil profile below plow depth

TERRACE DEPOSITS – Old alluvium bordering a stream or former channel of a stream. Continuous downward erosion by the stream has left these deposits well above the present-day flood plain

LAND RESOURCE ANALYSIS MAPS OF KNOX COUNTY

Knox County has a 1972 population in excess of 270,000. The Metropolitan Planning Commission (1968) projects an increase in population to approximately 360,000 by 1990. As the population grows and favorable areas like west Knox County approach their limit of development, more and more marginal land will be utilized. In order to utilize the existing land resources safely and efficiently, and in order to maintain a suitable environmental quality, knowledge concerning the physical environment and its limitations should be readily available to planners and decision makers. To provide some of these data, a series of maps, I–767, summarizing current knowledge about critical aspects of the physical environment has been prepared.



Compiled by Leonard D. Harris

Base from U.S. Geological Survey, 1:250 000, Chattanooga, Corbin, 1965; Johnson City, Knoxville, 1966

SCALE 1:125 000

5 4 3 2 1 0 5 MILES

5 4 3 2 1 0 5 10 KILOMETERS

SOURCES OF DATA

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Moneymaker, R.H., 1972, written communication, U.S. Dept. Agriculture, Soil Conservation Service.

Roberts, Wallace, Nichols, B.C., Odom, J.N., Gallatin, M.H., Odom, L.E., and Beesley, T.E., 1955, Soil survey of Knox County, Tennessee: U.S. Soil Conserv. Service, Soil Survey Series 1942, no. 10, 241 p.

SOILS

Soil as defined by the soil scientist is the material formed by weathering and biological processes acting on parent rocks or sediments. Differences among soils are due to (1) the original physical and chemical properties of the parent material, (2) climate, (3) plant and animal activity in and on the soil, (4) the configuration of the land surface, and (5) the length of time soil-forming processes have operated. The most important causes of differences among soils in Knox County are the original physical and chemical properties of the parent materials and the length of time soil-forming processes have operated.

Parent materials of soils in the county are of two broad classes: (1) material derived from weathering of sedimentary rocks in place (residuum), and (2) materials transported by gravity (colluvium) or by streams (alluvium). Distribution of soils derived from residuum is closely controlled by the distribution of different sedimentary rocks in Knox County. Weathering of these rocks has resulted in the development of residual soils arranged in a northeast-trending pattern nearly paralleling the pattern formed by sedimentary rocks (compare with Harris, 1972). Slow gravity movement of soils down slopes has modified the original distribution of residual soils by shifting their boundaries toward the valleys. Soil associations chiefly involved in these movements are map units 2, 3, 12, and 13. The alluvial soils are relatively small deposits along streams and show little relation to the trend of sedimentary rocks.

The soils of Knox County have been grouped into soil associations and the distribution of these associations is shown on the map.

EXPLANATION

SOIL ASSOCIATION AND MAP UNIT	DESCRIPTION	SUBSOIL TEXTURE	PARENT MATERIAL	PARENT ROCK
Stony land-Talbott 1	Dark reddish soils with many rock outcrops on rolling upland	Clayey	Residuum from weathering of limestone	Limestone
Decatur-Dewey-Emory 2	Deep red soils on broad low hills	Clayey	Alluvium from dolomite residuum	Dolomite
			Residuum from weathering of dolomite	
		Loamy	Colluvium from dolomite residuum	
Fullerton-Bolton-Clarksville 3	Pale-colored soils on hilly upland and steep ridges	Clayey	Residuum from weathering of dolomite	
		Loamy		
		Loamy and cherty		
Bland-Camp 4	Dusky red soils on hilly uplands and steep slopes	Clayey	Residuum from weathering of calcareous siltstone with subordinate shale and limestone	Calcareous siltstone, with subordinate shale and limestone
		Loamy	Colluvium from calcareous siltstone with subordinate shale and limestone residuum	
Sequoia-Bland-Leadvale 5	Intermingled dusky red and pale-colored soils on rolling and hilly uplands	Clayey	Residuum from weathering of shale with subordinate limestone and siltstone	Shale or calcareous siltstone with subordinate shale and limestone
			Residuum from weathering of calcareous siltstone with subordinate shale and limestone	
		Loamy	Colluvium from shale with subordinate limestone siltstone residuum	
Sequoia-Leadvale 6	Pale-colored soils in undulating and rolling valleys	Clayey	Residuum from weathering of shale with subordinate limestone and siltstone	Shale with subordinate limestone and siltstone
		Loamy	Colluvium from shale with subordinate limestone and siltstone residuum	
Sequoia-Litz-Dandridge 7	Pale-colored soils on low hills	Clayey	Residuum from weathering of shale with subordinate limestone and siltstone	
Armuchee-Leadvale 8	Pale-colored soils on hilly and steep uplands	Clayey	Residuum from weathering of shale with subordinate limestone and siltstone	
		Loamy	Colluvium from shale with subordinate limestone and siltstone residuum	
Dandridge-Litz-Leadvale 9	Pale-colored soils on steep hills	Clayey	Residuum from weathering of shale with subordinate limestone and siltstone	
		Loamy	Colluvium from shale with subordinate limestone and siltstone residuum	
Montevallo 10	Pale-colored soils on steep hills	Loamy and shaly	Residuum from weathering of shale with subordinate limestone and siltstone	
Jefferson-Montevallo 11	Pale-colored soils on gentle slopes	Loamy	Colluvium from sandstone with subordinate shale	
		Loamy and shaly	Residuum from weathering of shale with subordinate limestone and siltstone	
Tellico-Neubert 12	Deep red soils on steep ridges and knobs	Loamy	Residuum from weathering of calcareous sandstone with subordinate shale	Calcareous sandstone with subordinate shale
			Colluvium from calcareous sandstone with subordinate shale residuum	
Muskingum-Lehew-Jefferson 13	Pale-colored soils on steep ridges	Loamy	Residuum from weathering of sandstone with subordinate shale	Sandstone with subordinate shale
			Colluvium from sandstone with subordinate shale	
Staser-Hamblen and Lindside-Melvin 14	Dark soils along or near minor streams	Clayey Loamy	Alluvium from different parent materials	Flood-plain deposits from different parent rocks
Cumberland-Huntington 15A–15	Pale- to dark-colored soils along or near major streams	Loamy	Alluvium from different parent materials	Terrace deposits from different parent rocks
				Flood-plain deposits from different parent rocks

Colluvial deposits – Areas where soil has moved down slope by gravity Distribution of colluvium interpreted from aeroradioactivity map of Bates (1962)

Contact – Boundary between different soil associations

SOIL ASSOCIATION MAP OF KNOX COUNTY, TENNESSEE

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For sale by U.S. Geological Survey, price 75 cents