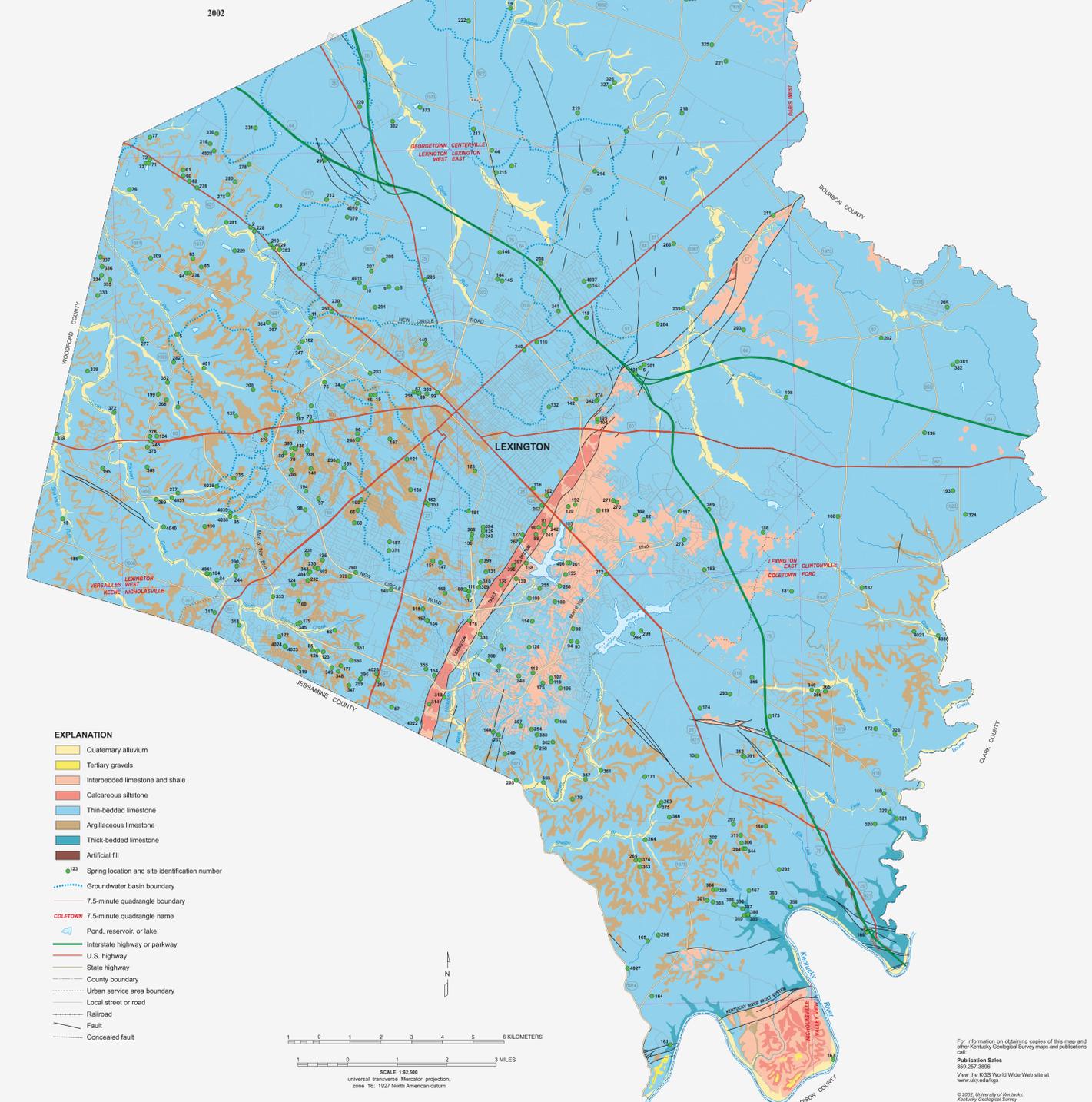


Inventory of Karst Springs of Fayette County, Kentucky

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Introduction

The purpose of this publication is to document karst springs in Fayette County and provide a resource to help the county's citizens understand the geologic hazards associated with karst development. It may be used as an aid in locating potential groundwater discharge points in case of hazardous material spills, and to provide a foundation for future studies of the geology and karst landscape in Fayette County.

It is also a basic historical record of the springs of Fayette County. Although over 300 springs are reported here, this inventory is not complete. At the time of publication, only 111 of the field sites were investigated. Unfortunately, many springs in the uninvested areas were already known and recorded in the Kentucky Geological Survey (KGS) database and are included in this publication.

The spring locations shown are mostly those discharging from karst conduits, but also include a significant number of soil seeps or water-wear springs (epikarst), and some springs apparently discharging from fractures created by faults. The springs vary in size from seasonal seeps to permanent flows with springs varying in discharge from a few gallons per minute to several million gallons per day. As the rapid pace of urban development continues in Fayette County, some natural springs reported here will become buried, and the records used to compile this publication will be an important resource in the future for separating natural from man-made groundwater discharge points.

Methodology

In an urban setting such as Fayette County, many springs have been routed into culverts to control drainage and maximize the areas of buildable land. Therefore, discharge from some streams has been reduced. Also, many springs have been covered by a variety of investigations and agencies to originate a natural groundwater discharge. This inventory was compiled from work by a variety of investigators and agencies, including geologic, hydrologic, and water resources agencies. Substantial field notes were also taken but have not been verified in the field by KGS staff. Users are encouraged to verify the suitability and accessibility of springs for their intended purpose before using in Fayette County.

Many of the data reported here were compiled into the groundwater database of the Kentucky Geological Survey from sources covering a period of several years. Some of these data were reported in the Kentucky Geological Survey's *Geology of Fayette County* (Thurhill and others, 1982). Some data are from field investigations by the Kentucky Geological Survey staff. Among the data in the database that do not have a source are data for springs reported as 900000 through the National Urban Stormwater Evaluation (NURSE) (Hoffman and Britton, 1994), conducted by the U.S. Department of Energy. The NURSE model is a computerized field work conducted by the Kentucky Geological Survey staff.

Kentucky Geological Survey staff themselves reported sites as natural seeps or springs. The origin of flow from all discharge points was assessed using the information in the KGS database, supplemented with field notes where available, and by field investigation for some locations. The criterion used to determine if a site was a natural spring included the occurrence of rock outcroppings, the persistence and volume of flow (seasonal, intermittent, etc.), characteristics of the stream bed (strange or such as channelized) into which the spring discharges, and the presence or absence of aquatic organisms. The documented topographic and cultural settings of the discharge point, the history of the site, and the presence of man-made structures such as culverts or drains (such as channelized) into which the spring discharges, water quantity, and temperature of the discharge were measured at those sites visited in the field. It was generally assumed that the stream was the above-ground groundwater discharge point from a rock outcrop.

The database records for the NURSE sites did not provide descriptive information. Although the accuracy of this data is largely unknown, a few of sites were checked in the field by KGS staff, and in all cases the sites could be found, and they were determined to be natural springs.

The geologic map of Fayette County used as the basis for plotting the spring locations was compiled from digitized representations of the geologic maps of Fayette County, Kentucky, by the Kentucky Geological Survey. The geologic map of Fayette County is based on the work of Garrison Silstone, Lexington, Lexington, and High Bridge Group have been simplified into five lithologies based on the relative abundance of carbonate (limestone) in each stratigraphic interval. Faults, as mapped on the 7.5-minute maps, are also illustrated.

Where the Springs Are Located

In the general Bluegrass Region and Fayette County has been well understood for 50 years, although the details remain mostly unknown. Springs discharge precipitation that has seeped or flowed into the subsurface within a catchment area, a karst groundwater basin. The karst groundwater basin in Fayette County is the Lexington Basin. The Lexington Basin is a significant amount of the county remains unexplored. Research on how to locate the best location for drilling water wells into the Lexington Basin and the Lexington Basin is needed. Research on how to locate the best location for drilling water wells into the Lexington Basin is needed. Research on how to locate the best location for drilling water wells into the Lexington Basin is needed.

The shallow perched water table near the surface is called a perched water table. The perched water table is a shallow water table that is perched above the main water table. The perched water table is a shallow water table that is perched above the main water table. The perched water table is a shallow water table that is perched above the main water table.

Springs are located in fault zones where the bedrock has been fractured by the movement of the fault in the geologic past. In some cases, the depth to the water table is controlled by the fault. In some cases, the depth to the water table is controlled by the fault. In some cases, the depth to the water table is controlled by the fault.

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