

MAPPED KARST GROUNDWATER BASINS IN THE CORBIN 30 x 60 MINUTE QUADRANGLE

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LEGEND

- Area of potential karst groundwater basin development
- Area of limited karst groundwater basin development
- Inferred perennial groundwater flow route
- Subsurface overflow (high-flow) route
- Groundwater basin catchment boundary
- Stream sink or swallet
- Underflow spring (perennial)
- Overflow spring (high flow)
- Karst window or sinking spring
- Cave stream
- Other tracer-injection point
- Tracer recovered in downstream dye receptor; spring location is unknown
- (1471) Kentucky Division of Water AKGWA spring identification number

TELEGRAPH Spring name

Explanation

This map shows karst groundwater basins in the Corbin 30 x 60 minute quadrangle, determined primarily by groundwater tracer studies. It can be used to quickly identify the groundwater basins and springs to which a site may drain. Major springs and the relative size of their catchment areas can be evaluated for potential as water supplies. The map also serves as a geographic index to literature on karst groundwater in the area.

This map is designed for regional and preliminary hydrologic investigations. Features such as springs and swallets are much too small to precisely locate on this map with a scale small enough to show regional relationships. See the literature cited in the "References Cited" for detailed site descriptions. The data used to compile this map were obtained by numerous investigators over the last 20 years. The underflow spring draining a groundwater basin is assigned a unique identification number, referred to as the AKGWA number (Assembled Kentucky Ground Water database). Individual basins are identified by the underflow spring name and AKGWA number. The authors of tracer data are identified by number in the "Data Source" column of the key, and are listed in "References Cited" in order of publication or research date.

Although groundwater flow routes shown here have been established by tracer studies, with the exception of mapped cave streams, the precise flow paths are unknown and are inferred or interpreted using water-level data, geologic structure, or surface features. Arrows show the direction of groundwater flow and tracer recovery locations. Conduit flow is illustrated as either thick trunk-flow lines or thinner tributary-flow lines. The locations of some groundwater basins are inferred, based on the existence of a

significant spring system and the delineation of adjacent basins. The position of groundwater basin boundaries should be considered approximate because of the map's scale and because boundaries can shift during high-water conditions. Also, excess flow may exit or enter a basin via surface or subsurface overflow routes. There are probably additional overflow routes. Although most of the groundwater-tracing results shown on this map were obtained during moderate- or high-flow conditions, the groundwater basins are illustrated in base flow because base flow is the most common flow condition. The main spring draining the basin is assumed to be an underflow spring that preferentially drains base flow. Overflow springs discharge during high flow. Generally, names of groundwater basins are derived from these main springs (Worthington, S.R.H., 1991, Karst hydrogeology of the Canadian Rocky Mountains: Hamilton, Ontario, Canada, McMaster University, doctoral dissertation, 380 p.). Only springs involved in tracing experiments are shown because of the small map scale.

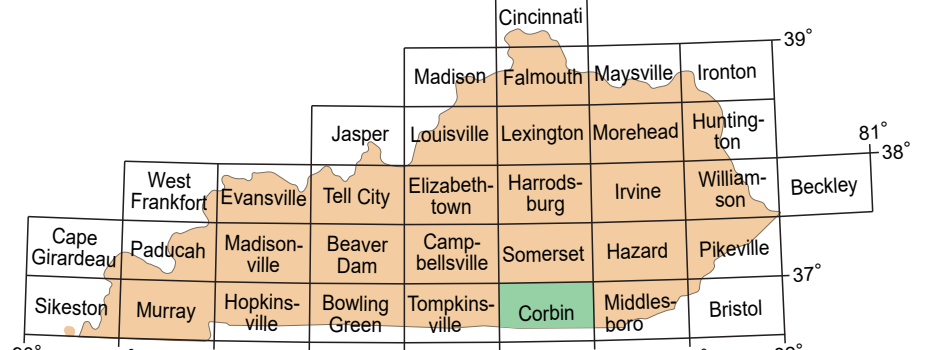
DISCLAIMER: This map is subject to revision upon receipt of new hydrologic data. The unshaded area (shown in white on the map) is karst. The shaded area (shown in light brown) is largely underlain by noncarbonate rocks and has minimal development of karst. Karst features are only shown in those areas where tracer tests have been conducted. Consult the "References Cited" for additional information.

KEY

AKGWA No.	Spring Name	Data Source
1251	J6 Group	1, 2
1471	Telegraph	5
1483	Old City	5
2539	Bridgeman Mountain	5
2540	Dry Hollow	5
3287	Coal Trace	4
3785	Sloans Valley Cave	3
NONE	Denny Hollow	5

REFERENCES CITED

- Sendlein, L.V.A., Dinger, J.S., Minns, S.A., and Sabha, A., 1990, Hydrogeology and groundwater monitoring of the John Sherman Cooper Power Station, Burnside, Kentucky: University of Kentucky, Department of Geological Sciences, 68 p.
- Hutcheson, S.M., Sendlein, L.V.A., Dinger, J.S., Currans, J.C., and Sabha, A.M., 1997, Hydrogeology and ground-water monitoring of coal-ash disposal sites in a karst terrance near Burnside, south-central Kentucky: Kentucky Geological Survey, ser. 11, Report of Investigations 11, 21 p.
- Currans, J.C., and Paylor, R.L., 2009, Documented groundwater tracing data, Sloans Valley project: Kentucky Geological Survey, data files.
- Currans, J.C., and Walden, W., 2010, Documented groundwater tracing data, Coal Trace springshed: Kentucky Geological Survey, data files.
- Blair, R.J., Vanderhoff, S.M., and Walden, W., 2016, Documented groundwater tracing data: Kentucky Division of Water, data files.



Locations of the 30 x 60 minute quadrangles covering Kentucky. This quadrangle, the Corbin quadrangle, is highlighted in green.

Acknowledgments: We thank the many karst investigators who have contributed data for this map. Without their cooperation, this map would not have been possible.

Statement of Benefit

Boundaries of groundwater basins in this 30 x 60 minute quadrangle were determined from dye-tracing data. The resulting map can be used to identify the groundwater basin or spring to which a site in this quadrangle may drain.

Cartography by Terry Hounshell and Emily Morris

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