



2016

Mapped Karst Groundwater Basins in the Elizabethtown 30 x 60 Minute Quadrangle

James C. Currens

University of Kentucky, currens@uky.edu

Robert J. Blair

Kentucky Energy and Environment Cabinet

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Kentucky Geological Survey Map and Chart. 211.

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

James C. Currens
Kentucky Geological Survey
Robert J. Blair
Kentucky Energy and Environment Cabinet-
Division of Water

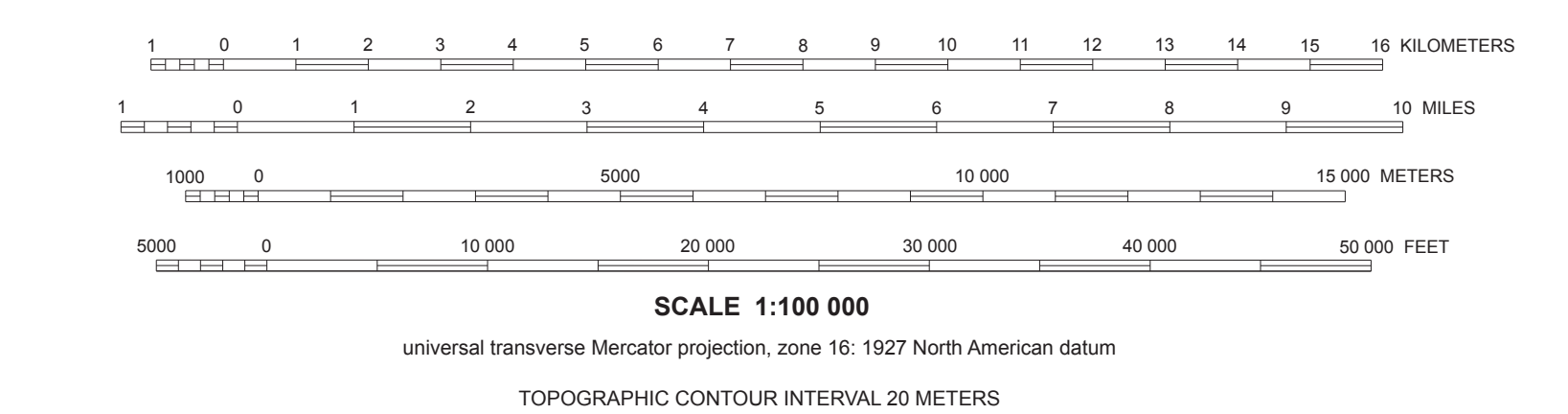
- LEGEND**
- Area of potential karst groundwater basin development
 - Area of limited karst groundwater basin development
 - Inferred perennial groundwater flow route
 - Subsurface overflow (high-flow) route
 - Surface overflow (high-flow) route
 - - - Groundwater basin catchment boundary
 - ⊗ Stream sink or swallet
 - Underflow spring (perennial)
 - Overflow spring (high flow)
 - Karst window or sinking spring
 - Cave stream
 - Other tracer-injection point
 - Kentucky Division of Water AKGWA spring identification number
 - Spring name

Explanation
This map shows karst groundwater basins in the Elizabethtown 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.

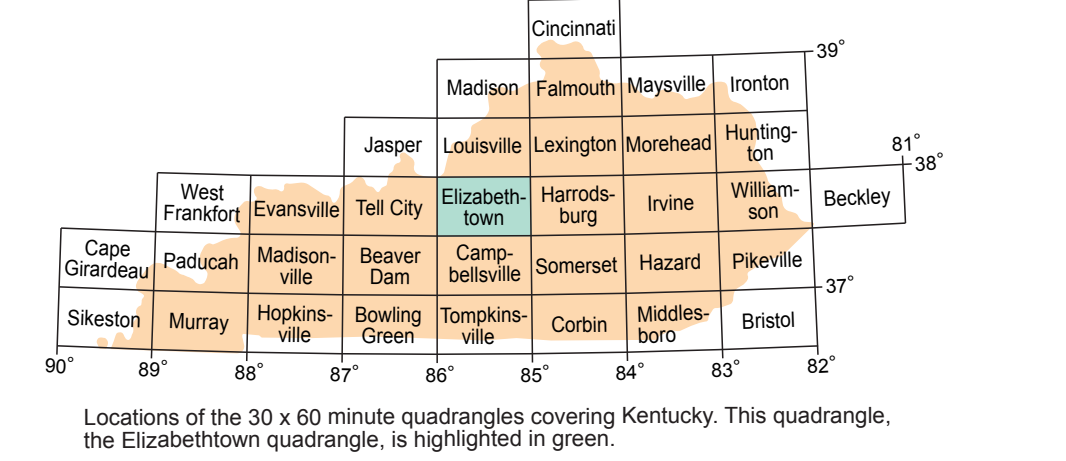
DISCLAIMER: This map is subject to revision upon receipt of new hydrologic data. The unshaded area (shown in white on the map) is karst. The shaded area (shown in light brown) is largely underlain by noncarbonate rocks and has minimal development of karst. Karst features are only shown in those areas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



REFERENCES CITED

- (1) Quinlan, J.F. and Ray, J.A., 1983. Documented groundwater tracing data: Mammoth Cave National Park Archives, no pagination.
- (2) Mull, D.S., Smoot, J.L., and Lieberman, T.D., 1988. Dye tracing techniques used to determine ground-water flow in a carbonate aquifer system near Elizabethtown, Kentucky. U.S. Geological Survey Water-Resources Investigations Report 87-4174, 95 p.
- (3) Crawford, N.C., and Dotson, C.B., 1989. Groundwater flow in the vicinity of the Sonora toxic waste site, Hardin County, Kentucky. Bowling Green, Ky., consultant's report, 15 p.
- (4) Taylor, C.J., 1997. Delineation of ground-water basins and recharge areas for municipal water-supply springs in a karst aquifer system in the Elizabethtown area, northern Kentucky. U.S. Geological Survey Water-Resources Investigations Report 96-4254, 22 p.
- (5) Connair, D.P., Engel, S.A., and Murray, B.S., 1999. Karst groundwater basin delineation, Fort Knox, Kentucky, in Beck, B.F., Herring, J.G., and Peit, A.J., Hydrogeology and engineering geology of sinkholes and karst. 1999. Proceedings, Seventh Multidisciplinary Conference on Hydrogeology and Engineering Geology of Sinkholes and Karst: Amsterdam, Balkema, p. 287-291.
- (6) Basquill, E., Curry, D., and Brown, H., 1999. City of Radcliff Comprehensive Plan, Element Three, Environment, 46 p.
- (7) Connair, D.P., and Engel, S.A., 2001. Groundwater basin limits and dye trace results, Phase II statewide karst groundwater assessment, Fort Knox, prepared by URS Corp. for U.S. Army Corps of Engineers, Nashville District, 69 p.
- (8) Currens, J.C., Paylor, R.L., and Spears, A., 2006. Hydrogeology of karst related flooding, Happy Valley karst valley (Ourgans swallow hole), Radcliff, Hardin County, Kentucky. Final report, Kentucky Geological Survey contract report to City of Radcliff, 48 p.
- (9) Currens, J.C., Paylor, R.L., and Lutz, D., 2007. Karst groundwater basin delineation for water quality management, Radcliff, Hardin County, Kentucky. Final report, Kentucky Geological Survey contract report to City of Radcliff, 33 p.
- (10) Blair, R.J., Ray, J.A., and O'dell, P.W., 2009. Integrated surface water and groundwater assessment of large springs in the Green River Basin, Kentucky Division of Water, 93 p.
- (11) Ray, J.A., Moody, J.R., Blair, R.J., and Currens, J.C., 2009. Mapped karst groundwater basins in the Tell City and part of the Jasper 30 x 60 minute quadrangle. Kentucky Geological Survey, ser. 12, Map and Chart 192, scale 1:100,000.

AKGWA No.	Spring Name	Data Source
0230	Goodman	1, 10
0701	Elizabethtown	2, 4
0702	Parle	11
0840	Saunders	5, 8, 9
1011	Head of Rough	1, 10
1117	Waddell (Bain ignatus)	2, 4
1427	Dyers (Garthers Station)	5, 6, 9
1428	Bank-Fontain	5, 6, 9
1429	Leaning Cedar	5, 6, 9
1430	Mud Mound	10
1443	Big Heady	10
1907	Langley	11
1909	Sycamore	5, 7, 9
2184	Pecks blue hole	9
2568	SPC	10
2673	Nollynn	10
2660	Dual (SP247)	9, 8, 9
3262	Ream	9
3253	Halle (Weston)	9
3255	Mossy Lake	9
3258	Saunders Overlook	9
3486	Oldham	9
3516	Valentine	9
3517	Skylight	9
3520	Reesor	9
3592	Falling Springs	9, 8, 9
3593	7th Armored Div. Rd.	6, 8, 9
3798	Hankins blue hole	10, 11
3910	Starks	2
3911	Tharpe	11
4048	Able	4
4050	Cave Spring	1



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

Cartography by Terry Housheer

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