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## Generalized Block Diagram of the Eastern Pennyroyal Karst

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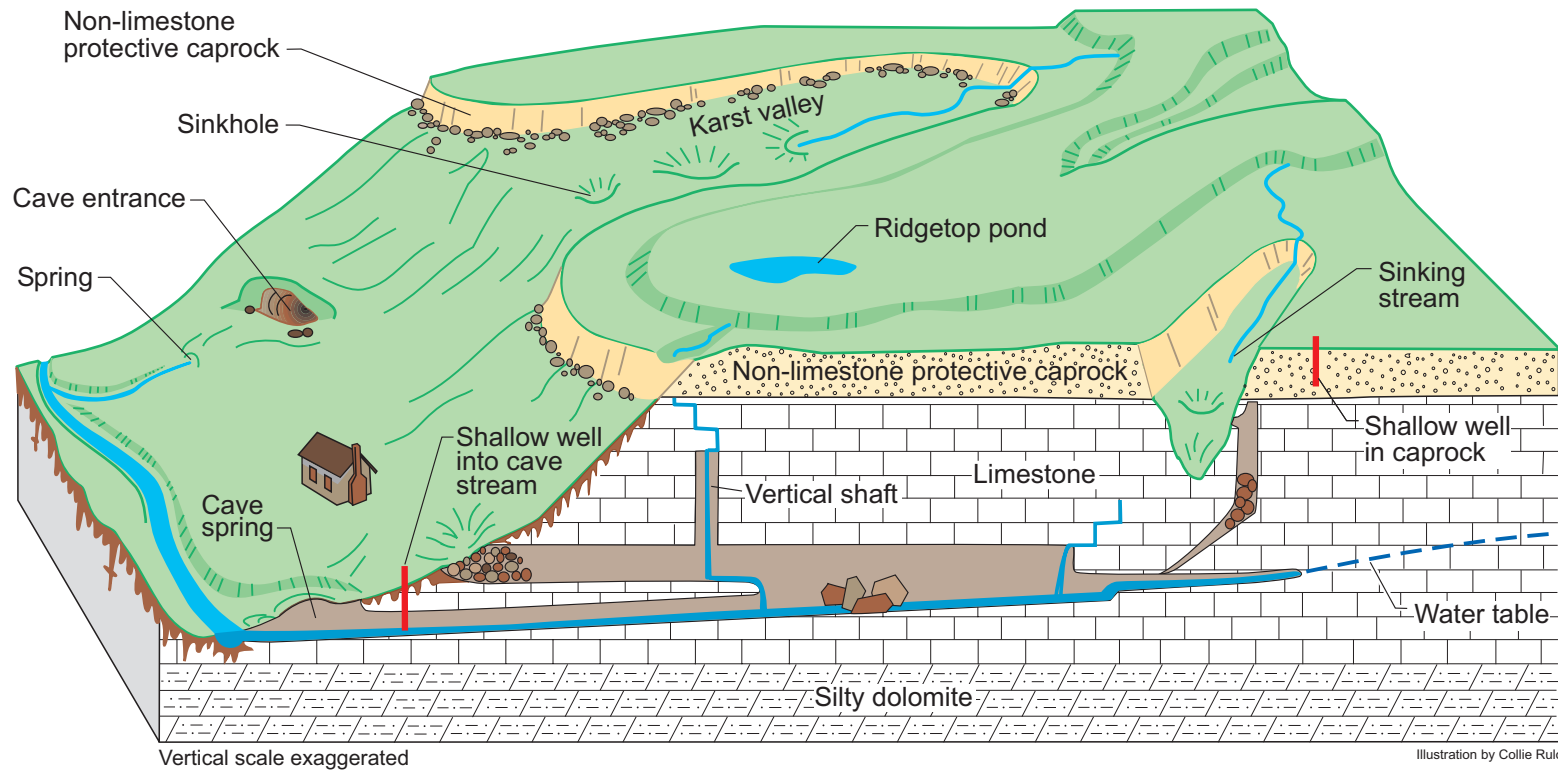
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# Generalized Block Diagram of the Eastern Pennyroyal Karst

James C. Currens



## Eastern Pennyroyal karst:

Karst occurs where limestone or other soluble bedrock is near the earth's surface, and fractures in the rock become enlarged when the rock dissolves. Sinkholes and sinking streams are two surface features that indicate karst development. In karst areas most rainfall sinks underground, resulting in fewer streams flowing on the surface than in non-karst settings. Instead of flowing on the surface, the water flows underground through caves, sometimes reemerging at karst windows, then sinks again to eventually discharge at a base-level spring along a major stream or at the top of an impermeable strata. The development of karst features is influenced by the type of soluble rock and how it has been broken or folded by geologic forces. There are four major karst regions in Kentucky: the Inner Bluegrass, Western Pennyroyal, Eastern Pennyroyal, and Pine Mountain. This diagram depicts the Eastern Pennyroyal karst.

In the Eastern Pennyroyal, most ground-water basins, and subsequently caves, occur along the flanks of ridges. The floors of the valleys separating the ridges are largely underlain by silty dolomites that are only slightly soluble. The headward area of the valleys may be underlain by limestone, and when this is the case, they are typically karst valleys. The cave passages closer to the middle of the ridges are protected from erosion by the nonsoluble rocks topping the ridges. As erosion continues over geologic time, the major stream draining the karst terrane cuts its channel deeper. In response, deeper conduits increase their flow to the major stream, and new springs develop at lower elevations along the stream's banks. Older, higher flow routes are left as dry cave passages. Insoluble impurities in the bedrock, such as shale layers, also influence the location and development of vertical shafts and caves. To produce significant amounts of water, wells drilled into karst aquifers must intersect a set of enlarged fractures, a dissolution conduit, or a cave passage with an underground stream.