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Generalized Block Diagram of the Inner Bluegrass Karst

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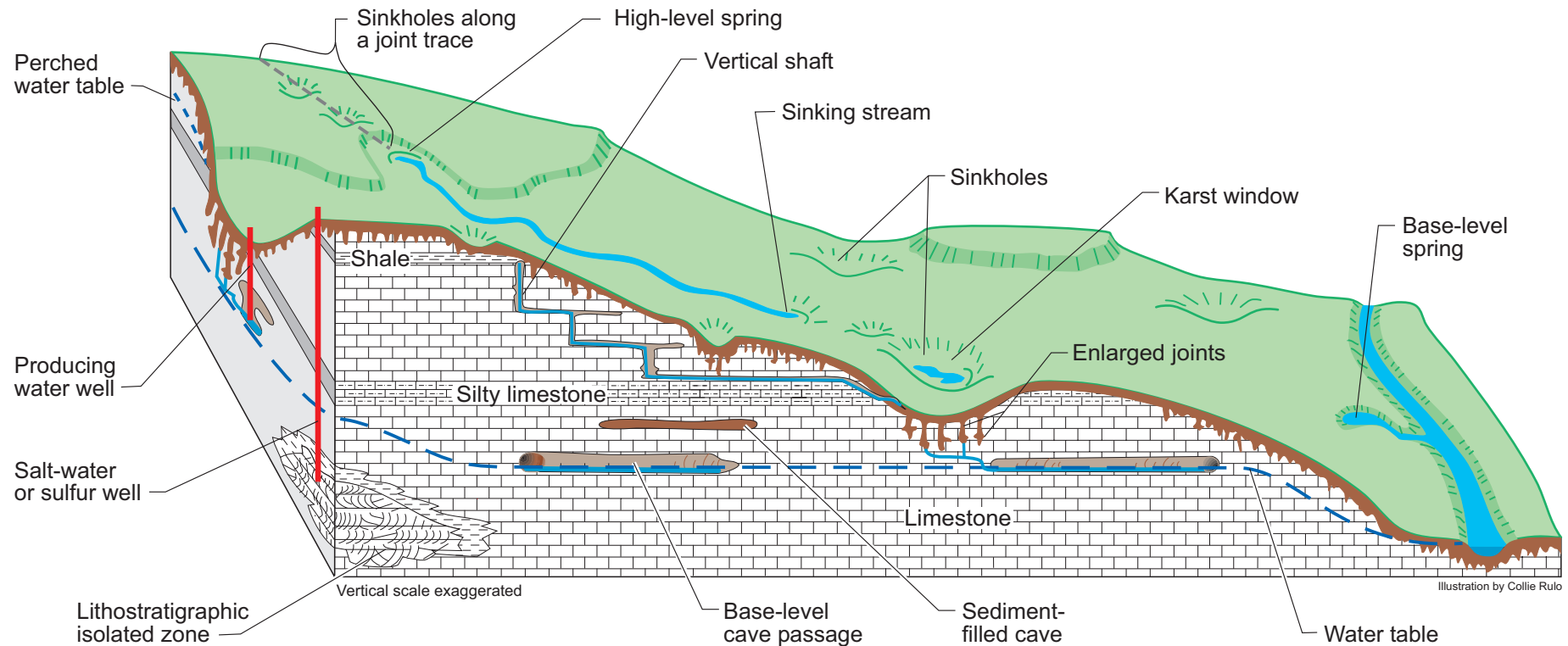
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Generalized Block Diagram of the Inner Bluegrass Karst

James C. Currens



Inner Bluegrass 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 Inner Bluegrass karst.

In the Inner Bluegrass, insoluble impurities within the limestone, such as shale, result in a perched or isolated water table that discharges ground water at high-level springs or may locally isolate pockets of saltwater or sulfur water. In some locations, vertical fractures in the rock, called joints, may increase the rate of water flowing toward base level. The joints and impurities also influence the location and development of vertical shafts and caves. As erosion on the surface continues over geologic time, the major stream draining a 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, some of which become sediment filled. 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.