

# Ghosts of the Past in Kentucky

*Some of Kentucky's defining features today are the result of climate changes in the region's past.*

## Mammoth Cave

During the Mississippian Period in geologic time (325 to 360 million years ago), the North American continent was closer to the equator and warmer than it is today. A shallow sea covered most of the southeastern United States, including what is now Kentucky. Its warm water supported a dense population of tiny marine organisms with calcium carbonate shells. As they died, their shells accumulated on the sea floor, over time forming 600 to 700 feet thicknesses of limestone. Later, an ancient river deposited some 60 feet of sandstone on top of the limestone.

As the climate cooled, eventually the sea and the river disappeared and, with time, wind and rain eroded the sandstone cap. About 10 million years ago, cracks and holes began to expose the limestone underneath. Rainwater worked its way underground in the form of sinking streams, which began hollowing out the cave as underground rivers. Many caves have developed in these limestones during the past 5 million years, including the world's longest cave system, Mammoth Cave.

## Kentucky Coal Fields

During the Pennsylvanian Period (290 to 325 million years ago), often called the Coal Age, parts of Kentucky were covered intermittently by shallow seas. Marine waters advanced and receded many times. The climate was warm, and extensive forests grew in great coastal swamps at the edge of the water. When the sea was out, the low coastal plains were covered with luxuriant forests of seed ferns, ferns, scale trees, and dense vegetation.

During times of heavy rainfall, this dense vegetation fell into the swamp in thick accumulations that formed peat. Clay sealed the vegetation from oxygen, preventing decay. The process was repeated many times. The weight of sediments over long geologic time compressed the buried vegetation into the numerous coal beds in Kentucky's two coal fields – in the Cumberland Plateau in the east, and in the counties around Owensboro in the West.

## Ohio River

North America was profoundly affected by a series of ice ages during the Quaternary Period (1.8 million to 10,000 years ago), during which the Earth's surface temperature dropped significantly and much of the continent was covered with extensive glaciers. Although the continental ice did not reach into Kentucky, the general course of the present Ohio River Valley was shaped by glacial activity during this time.

The pre-glacial Ohio was a much smaller river than today. Advancing ice sheets blocked the northward flowing streams with rock debris and diverted their flow to new courses near the margins of the glaciers. As the climate warmed, flood waters from the melting glaciers filled portions of the old channel of the Ohio River with sand, gravel, and

clay, forcing the river to seek an alternate route across a buried bedrock ridge. Thus, the current river channel – and the Falls of the Ohio, southwest of Louisville – were formed. The older pre-glacial route of the Ohio River remains filled and is buried under what is now downtown Louisville.

## Big Bone Lick State Park

The fossilized bones of many different Ice Age megafauna have been discovered in the area that is now Big Bone Lick State Park in the northern tip of Kentucky. Scientists speculate that during the period from 12,000 to 20,000 years ago, many prehistoric mammals that had not previously been found in Kentucky were slowly driven southward by the extreme cold and ice sheets. These animals came to the swampy land in northern Kentucky to feed. They included giant mammoths and mastodons, bison, primitive horses, stag-moose, and ground sloths.

The earliest peoples, starting in the Pre-Paleo Period (13,000 BC), found a seemingly endless supply of wild game to hunt in and around the mineral and salt springs and Big Bone Lick naturally became a hunting ground. Over the millennia, the animal bones gradually accumulated and were frequently covered by flooding sediments, which fossilized and preserved them until today.



## Sources

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