

**Characteristics of Hydrocarbon Reservoirs in Paleozoic Rocks in Kentucky**, Patrick J. Gooding, Kentucky Geological Survey, University of Kentucky, Lexington, KY 40511, gooding@uky.edu

Hydrocarbons in Kentucky occur throughout much of the Appalachian Basin, along the Cincinnati Arch, and in the Illinois Basin. More than 1,500 oil and gas pools produce from over 60 different formations throughout the Paleozoic. Most of the oil is produced from Mississippian limestones and sandstones in eastern and western Kentucky or from Ordovician limestones and dolostones in south-central Kentucky. Most natural gas is produced from the Devonian black shales of eastern Kentucky.

The composition and physical properties of the Paleozoic reservoir rocks across Kentucky are varied. Hydrocarbons commonly occur in a wide range of rock types and depositional settings ranging in age from Early Cambrian to Early Pennsylvanian. A much better understanding of the depositional and diagenetic history and geologic controls on reservoir development is being provided by geologic research, as well as new insights to porosity, permeability, maturation, generation, migration, and accumulation of hydrocarbons in Kentucky. New discoveries on the influence of structural activity and tectonic events, both regionally and locally, are coming to light.

Devonian black shale-sourced hydrocarbons have migrated both vertically and horizontally from deep within the Appalachian and Illinois Basins. They are transported both horizontally and vertically through faults, fractures, joints, weakened bedding planes, vugs, breccias, and unconformable surfaces throughout the basins and along the flanks of the arch to accumulate in the Paleozoic reservoirs of Kentucky.

New geochemical and geophysical data, the evolution of computer modeling, new and innovative drilling, stimulation, and completion techniques make it imperative to reexamine and reevaluate the basins.