



# The landscape and mineral resources of Illinois

Illinois is about 385 miles long from north to south and about 218 miles wide; its area is 55,947 square miles. Surface elevations above mean sea level range from 285 feet at the confluence of the Ohio and Mississippi Rivers to 1241 feet at Charles Mound in the northwestern corner of the state; the average elevation is 600 feet.

The land surface over most of Illinois was formed during the Great Ice Age, which in Illinois lasted from more than 2 million years ago until about 11,000 years ago. As much as 90 percent of the state was covered by at least one of several sheets of glacial ice. This area includes the relatively flat plain left by the Illinoian glacier, which melted away about 130,000 years ago, and the ridged topography of the northeastern quarter of Illinois formed by the Wisconsinan glacier, which disappeared from Illinois about 11,000 years ago. The glaciers covered the old rocky land surface with deposits of loose, unconsolidated rock materials. Soils have developed in the upper part of these materials. The more rugged parts of Illinois are those that escaped glaciation—the northwestern corner, areas along the Mississippi River, and the southern tip.

Illinois is endowed with a variety of mineral resources that add millions of dollars to the wealth of the state each year.

**Coal**, a combustible rock formed millions of years ago from deeply buried layers of partly decayed plants, is one of Illinois' most vital mineral resources. Illinois ranks among the top 6 coal-producing states. More than 75 different coal beds have been identified in Illinois, but most are relatively thin. More than 20 coal seams have been mined, at least locally. Seven seams are being mined now—2 extensively because of their large reserves. Our coals are mined by both strip and underground methods. Strip mines usually operate where the coal is at shallow depths. Coal mined in Illinois is used mainly for generating electric power, but specialized products also are produced from coal and coal tar. **Coke**, the solid material produced by heating certain coals at high temperatures in the absence of air, is a valuable fuel for use in blast furnaces in the

manufacture of steel. Much research is being done to find methods of removing sulfur compounds from our coal so that it can be more widely used.

**Petroleum**, the dark oil found in rocks, is believed to have been derived from ancient plants and animals, mostly of microscopic size, that were part of the countless tons of sediments that accumulated on ancient sea bottoms. As these sediments hardened into sedimentary rocks, hydrocarbon droplets were produced which later migrated through the rocks and accumulated in certain areas, called "traps." In 1975, the deepest oil test hole ever drilled in Illinois reached a total depth of more than 14,000 feet in sedimentary rocks in extreme southern Illinois. The deepest oil-producing zone in Illinois occurs at a depth of about 5,380 feet. Most of the more than 31,000 currently producing oil wells in Illinois must be pumped, and the majority produce 10 barrels or less of oil per day. In 1940-41, Illinois ranked fourth among the oil-producing states. Since then, however, the discovery of new oil reserves has fallen behind the amount of oil produced. But the search goes on with well over a thousand oil and gas test wells being drilled annually in Illinois.

**Stone and stone products.** Limestone and dolomite are the most widely quarried rocks in Illinois, and crushed stone is the state's most important rock product. Limestone and dolomite quarries are located where thick stone deposits occur near the surface because of upwarping and erosion of the bedrock. The quarries are mainly in the northern quarter of the state, where some are among the largest in the world; along the western side of the state; and near its southern tip. Millions of tons of stone are crushed annually for use as construction aggregates, road surfacing material, agricultural limestone, lime, and a major ingredient of cement. Small amounts are used for alkali and glass production, railroad ballast, building stone, and other purposes.

**Clay** is a very fine-grained rock made up of a group of minerals produced by weathering of different kinds of

rocks. In Illinois, clay deposits are either unconsolidated surficial clays or consolidated bedrock clays or shales. Clay is used in the manufacture of common brick, tile, refractory brick, stoneware vessels, plaster, and cement and is a bonding agent in molding sand.

**Sand and gravel** in much of Illinois was deposited by glaciers. As the great ice sheets melted, the rock materials they had picked up and crushed as they advanced southward were released and swept away by torrents of meltwater. In the northern half of the state especially, many deposits of sand and gravel are used for construction. Chert or flint gravels that are older than the glacial deposits are found locally in western and extreme southern Illinois.

**Silica sand** consists of fine grains of the mineral quartz. Commercial silica sand is produced from sandstone bedrock; silica sand from northern Illinois is famous for its high purity and is widely used in making glass. Silica sand is also used as molding sand because it can withstand the high temperatures used in casting steel and other metals. It is also used in fracture-treating wells to help increase oil production and in sandblasting. Ground to a fine powder, it is used as an abrasive for polishing plate glass and as an ingredient in scouring compounds, paint fillers, pottery glazes, and enamel.

**Tripoli** consists of tiny particles of quartz; deposits are found in extreme southern Illinois. It is used in the ceramic industry and in polishing optical lenses; it is also used as a paint filler and as a fine abrasive.

**Fluorspar, or fluorite**, is a glassy, crystalline mineral composed of calcium and fluorine. Much of the fluorspar produced in the United States comes from a small area in

Illinois and Kentucky where it is extracted from horizontally bedded deposits or from nearly vertical veins in mines that may be almost 900 feet deep. It is used as a flux in the steel industry and in the manufacture of hydrofluoric acid. This acid is used in the preparation of many other fluorine compounds, particularly those used in the production of fluorocarbons (refrigerants, plastics, aerosols), insecticides, and high-energy fuels for rockets and missiles.

**Lead and zinc** are found as ores in deposits in extreme northwestern Illinois and, in conjunction with fluorspar, in southeastern Illinois. The mineral galena is the principal ore of lead; the chief ore of zinc is the mineral sphalerite. For many years, Illinois was the leading producer of lead in the United States, but now all of the northwestern Illinois mines are closed.

**Peat**, deposits of which are scattered across northern Illinois, is used mainly as a soil conditioner. This material is debris from rich growths of plants that accumulated in low sags to form bogs across the land surface as the Wisconsin glaciers melted away. Illinois ranks second among the states in peat production.

**Ground water** is water that fills all openings in the ground in the zone of permanent saturation. The top of the zone of saturation is called the water table. The source of ground water is precipitation (rain or snow) that seeps into the soil and percolates downward. Ground water is most readily obtained from saturated rocks that have fairly large openings between grains (such as sand, gravel, and sandstone) or that have interconnected cracks or channels (such as limestones). Ground water is the principal source of water for most farms and for a large number of municipalities and manufacturing companies in Illinois. □



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