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Coal Resources of the Upper Elkhorn No. 3B Coal (Upper Bed) in Eastern Kentucky

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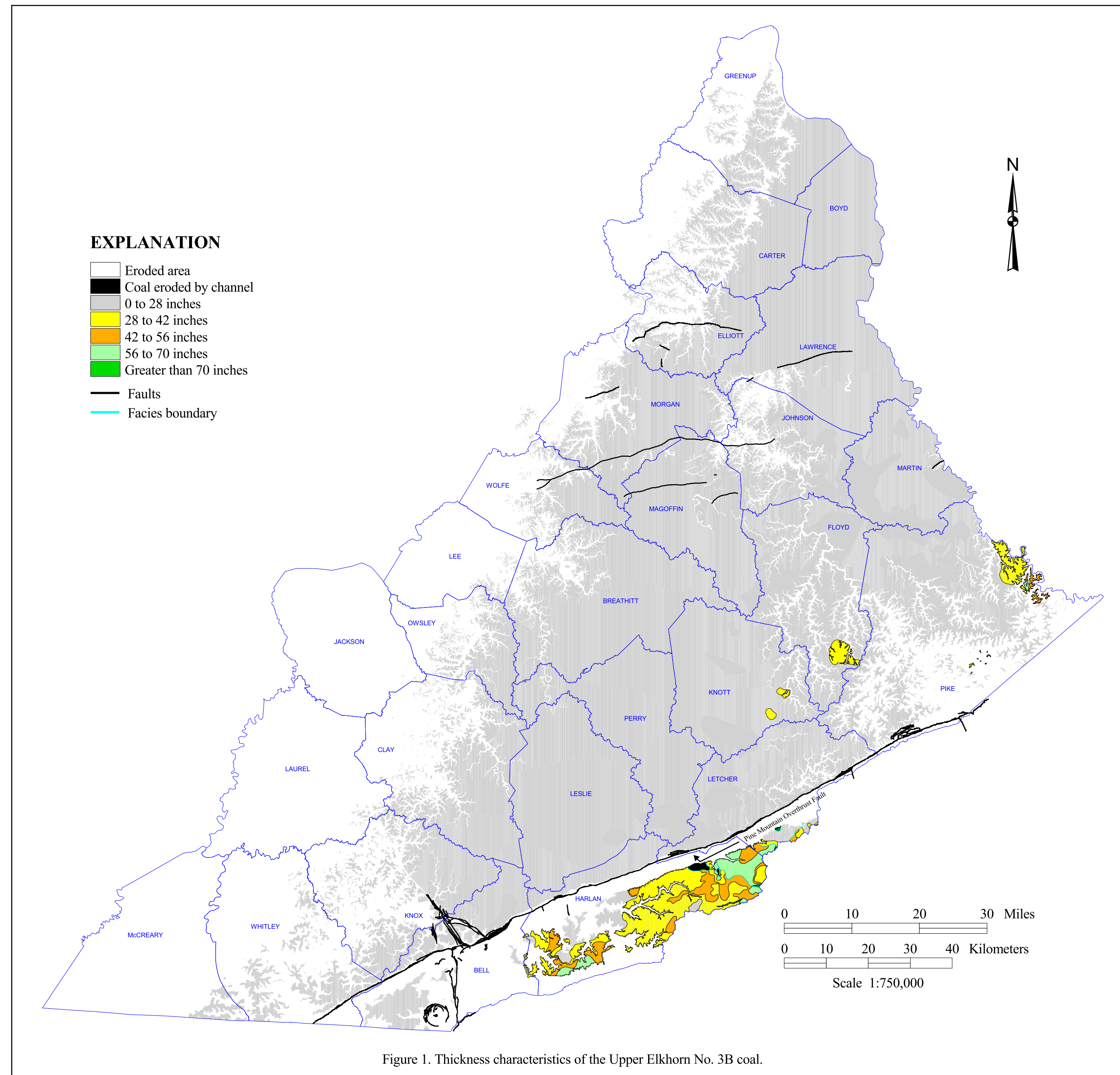


Figure 1. Thickness characteristics of the Upper Elkhorn No. 3B coal.

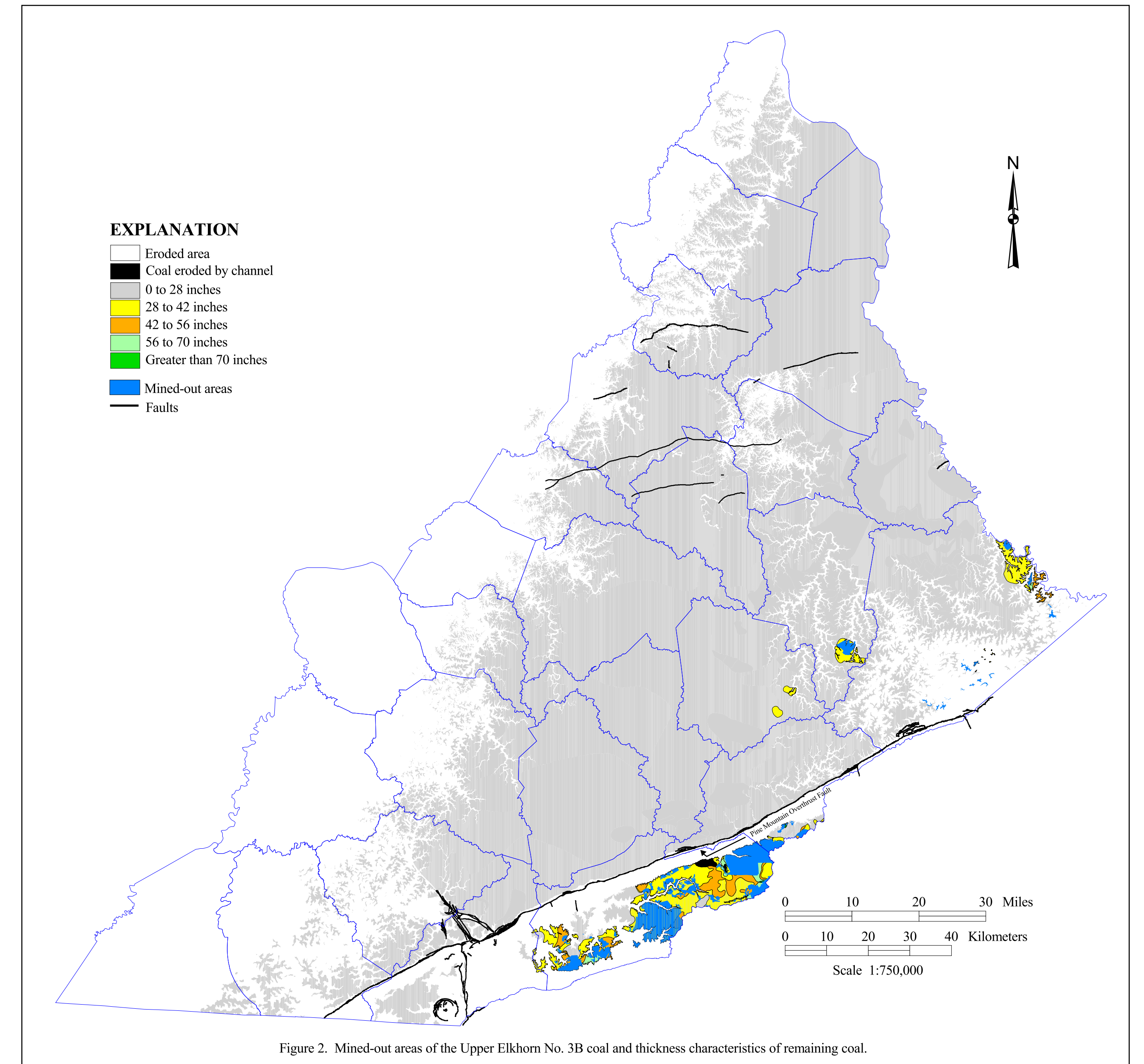


Figure 2. Mined-out areas of the Upper Elkhorn No. 3B coal and thickness characteristics of remaining coal.

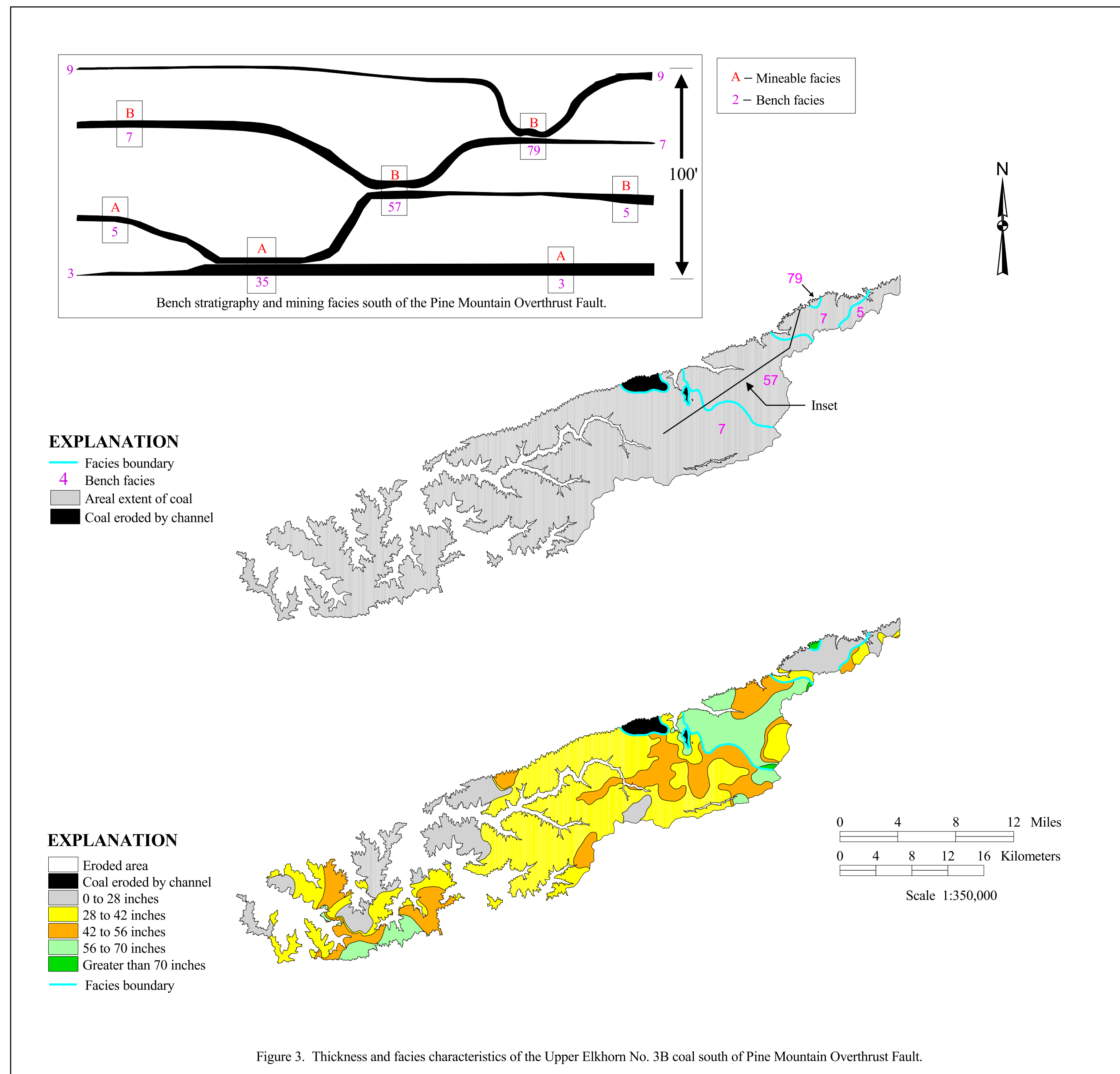


Figure 3. Thickness and facies characteristics of the Upper Elkhorn No. 3B coal south of Pine Mountain Overthrust Fault.

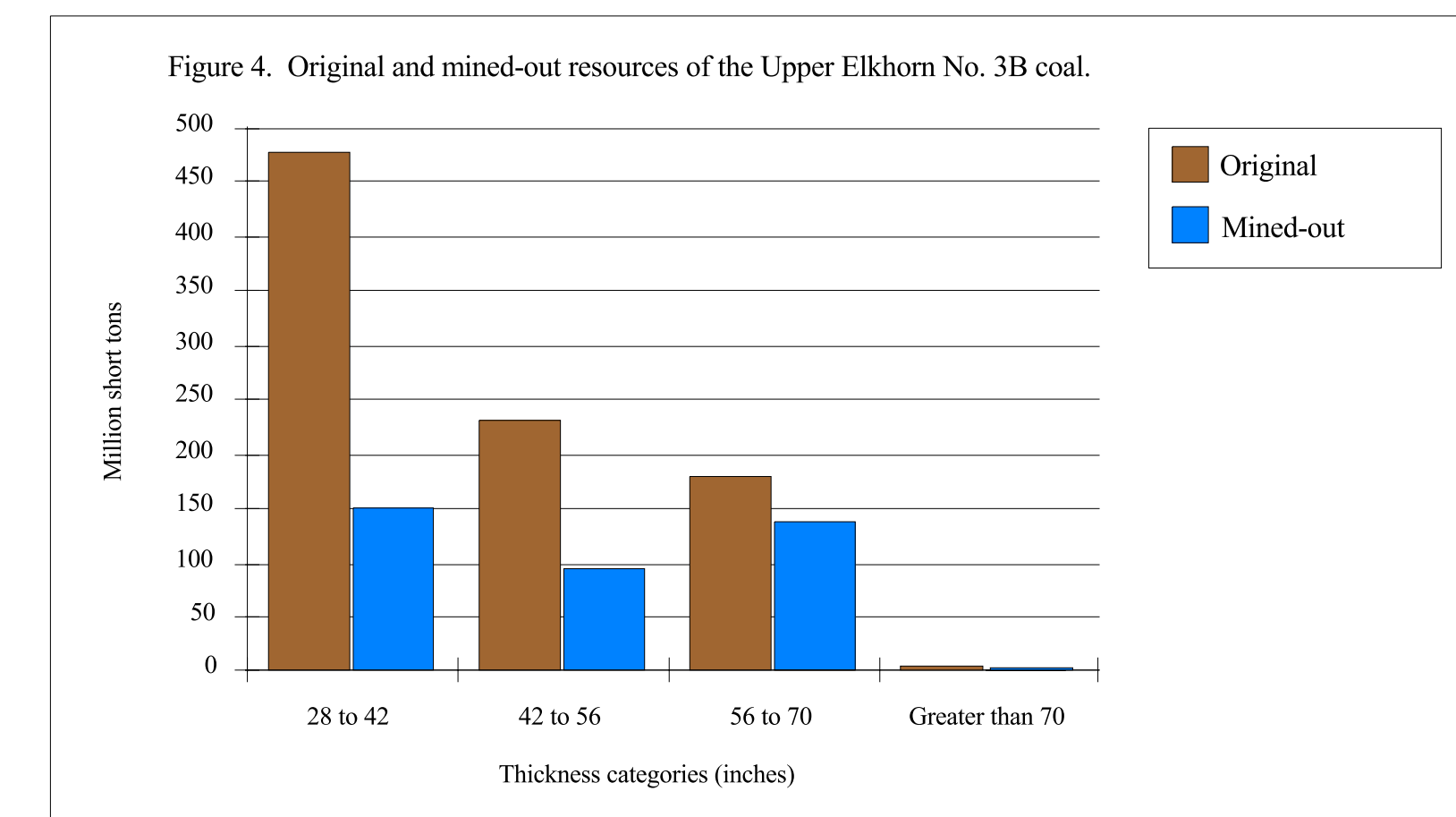


Figure 4. Original and mined-out resources of the Upper Elkhorn No. 3B coal.

Overview

This chart is one of a series that shows the regional characteristics of the Upper Elkhorn No. 3 coal zone. The maps and charts were prepared as part of the U.S. Geological Survey's National Coal Assessment Program, which compiles regional maps and databases that provide a comprehensive assessment of the most important coal beds in the nation. The Upper Elkhorn No. 3 coal zone has been one of the leading producers in the state of Kentucky and, in some areas, is of very high quality. Bed stratigraphy within the Upper Elkhorn No. 3 zone and thickness of the No. 3A coal are described in KGS Map and Chart Series 7-8 (series 12). This chart shows original total coal thickness (Fig. 1), mined-out areas (Fig. 2), mining facies (Fig. 3), and resource calculations (Fig. 4) for the Upper Elkhorn No. 3B coal (also known as the Darby or "C" seam south of the Pine Mountain Overthrust Fault). The coal-thickness map is not a traditional isopach map, because the mineable bed is not composed of the same benches in all areas (Fig. 3). Discontinuities, delineated by facies boundaries on the map, indicate abrupt changes in thickness caused by splitting; the coal-thickness map also occurs between areas where entirely different beds in the Upper Elkhorn No. 3 zone are favored for mining.

Point Data

Coal-thickness and elevation measurements were derived from two different databases. The Kentucky Coal Resources Information System (KCRIS) contains field descriptions of coal beds that were made at natural outcrops, roadcuts, and surface and underground mines. Data collected at these localities were total coal thickness, bottom elevation, and, in some cases, total parting thickness. The second database contains records of borehole information obtained from coal companies and government agencies. This database also contains measurements of rock strata above and below the target coal bed. Data from 323 localities cited in the KCRIS database and 1,516 boreholes were used to prepare this chart.

Map Preparation

The outcrop area of the Upper Elkhorn No. 3 coal zone was compiled from individually digitized 7.5-minute geologic quadrangle maps. The lower coal contact was used to represent both the 3A and 3B beds. Personnel of the Kentucky Revenue Cabinet and the Kentucky Geological Survey digitized the maps. For quadrangles where the coal had not been geologically mapped, the position of the coal outcrop was inferred, where possible, based on underlying or overlying beds.

Thickness data were plotted on 1:100,000-scale base maps. Standard U.S. Geological Survey 14-inch categories, beginning at 28 inches, were manually drawn and digitized. Contour lines do not cross lines of discontinuity, such as coal-bed split lines. Also, some anomalous data points were not used in order to avoid overly complex contouring. Split lines shown on Figure 3 were determined from analyses of drill-hole data and mine maps. Numbers on Figure 3 indicate the combination of coal benches that make up the mineable bed as shown on the inset.

Mined-Out Areas

Maps showing the boundaries of underground mines are maintained by the Kentucky Department of Mines and Minerals; the data are compiled on 1:24,000-scale base maps by coal bed, and cover the period between 1948 and 1993. We transferred generalized outlines of mined areas for the Upper Elkhorn No. 3B coal to 1:100,000-scale base maps according to coal-bed designation. Precise boundaries between adjacent mines were not documented. We then inspected large-scale mine maps for mines with more than 1 million tons of production between 1993 and 1999 and appended newly developed areas to the 1:100,000-scale maps. Seam sections and mine elevations were collected from some mine maps and compared to drill-hole and outcrop data for nearby locations to verify coal-bed correlation. Vector polygons of mined areas were digitized from the 1:100,000-scale base maps and encoded with attributes to identify local coal-bed names. South of the Pine Mountain Overthrust Fault, both the Kellioka (3A) and Darby (3B) beds are commonly mined at the same locality; interburden thickness is as little as 30 feet. For some mines, data were insufficient to determine with confidence which bed was mined. In such cases, bed assignment was based on coal-thickness information and bed names provided by operators.

More Information

A list of publications that relate to the Upper Elkhorn No. 3 coal zone can be found on the KGS Web site at www.uky.edu/KGS/uc3references.html.

Acknowledgments

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