

FOREWORD

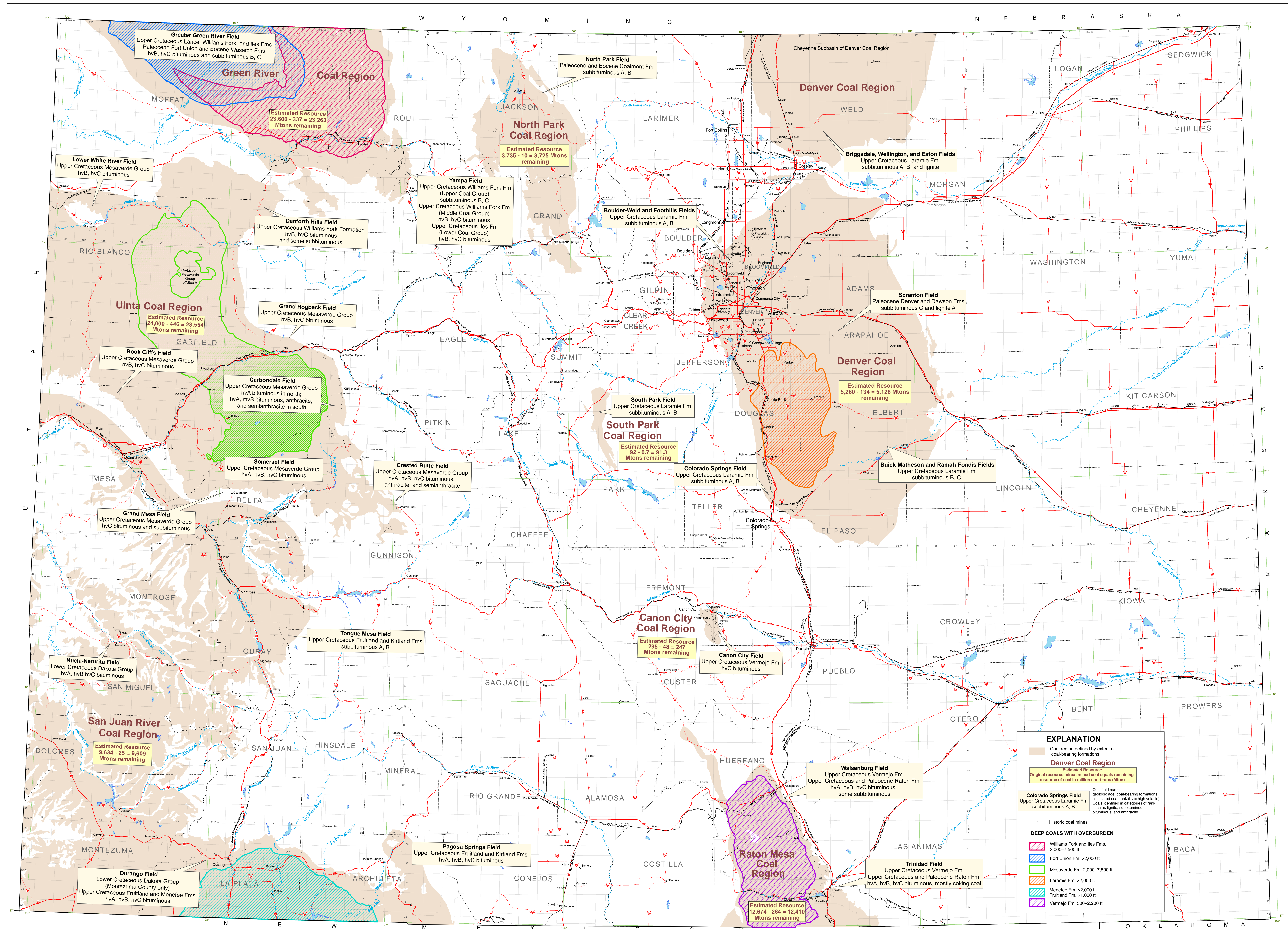
The purpose of Colorado Geological Survey Map Series 43 is to compile coal resource information into a 3-map series covering the State of Colorado. These maps contain information on coal ranging from coal mine boundaries, coal fields and coal regions, to displaying values for coal rank, quality, and recent coal developments and exploration. This CD-ROM publication contains three maps in PDF format for viewing on computer screen or for printing. The files are formatted to plot at 1:500,000 scale. Coal Resource Maps of Colorado, 2006 is an update of a 1978 Colorado Geological Survey (CGS) publication entitled Map Series 9, Coal Resource and Development Map of Colorado, by D.C. Jones and J.E. Schultz. The 1978 map is also included as a digital TIF image on the CD-ROM, and an introduction for the new map series is included. This publication can be used by coal scientists and engineers, coal mine managers, local governments, and the general public for researching information on coal resources of Colorado.

This mineral resources project was funded by the Colorado Geological Survey utilizing funds from the Colorado Department of Natural Resources Severance Tax Operational Fund. Severance taxes are derived from the production of gas, oil, coal, and minerals.

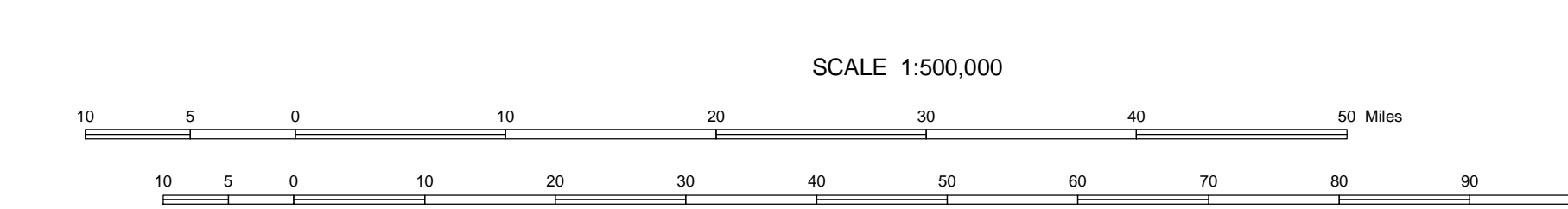
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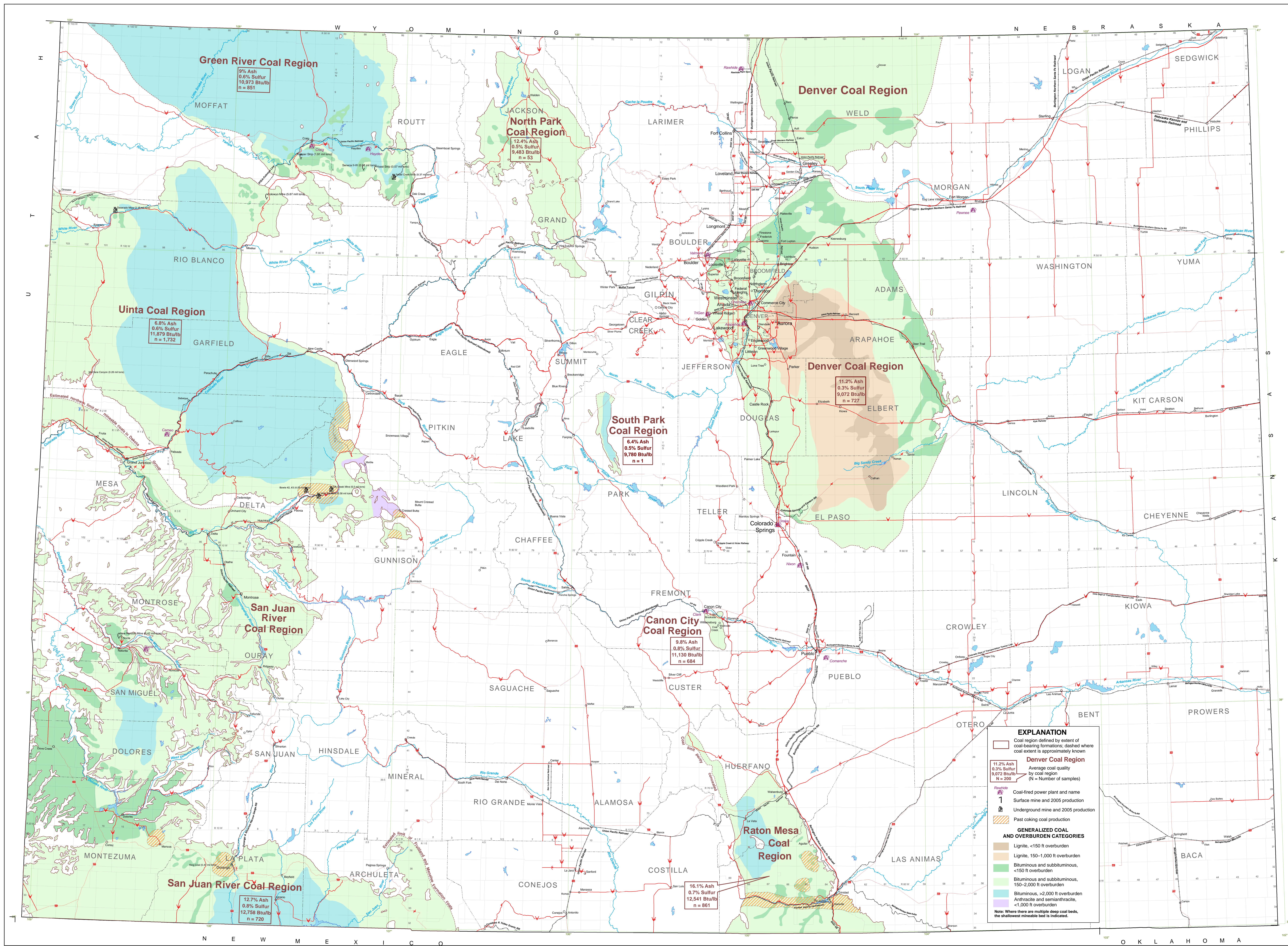


Data sources: counties, highways, and railroads—Colorado Department of Transportation; boundaries and names—USGS National Map Information Service; Coal Resources and Development Map of Colorado, 1978, by David C. Jones, Janet E. Schultz, and D. Keith Murray; historic coal mines—CGS Information Series 64, Historic Coal Mines of Colorado, 2002, by Christopher J. Carroll and Mark A. Beaser



Coal Quality in Colorado, 2006

By Christopher J. Carroll



EXPLANATION

Coal region defined by extent of coal-bearing formations; dashed where coal extent is approximately known

Denver Coal Region
Average coal quality by coal region (N = Number of samples)

11.2% Ash
0.3% Sulfur
9,072 Btu/lb
N = 727

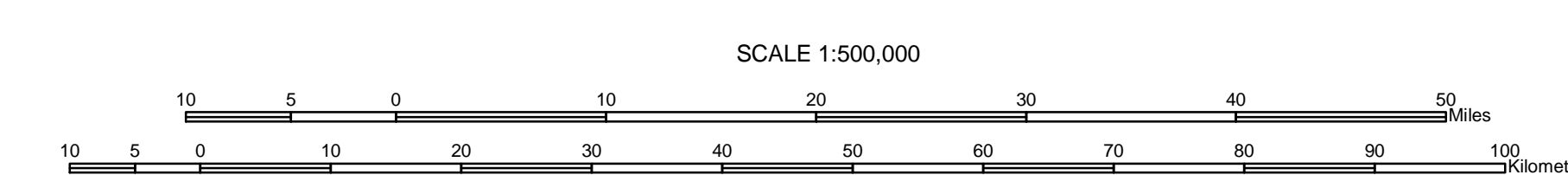
Coal-fired power plant and name
Surface mine and 2005 production
Underground mine and 2005 production
Past coking coal production

GENERALIZED COAL AND OVERBURDEN CATEGORIES

- Lignite, <150 ft overburden
- Lignite, 150-1,000 ft overburden
- Bituminous and subbituminous, <150 ft overburden
- Bituminous and subbituminous, 150-2,000 ft overburden
- Bituminous, >2,000 ft overburden
- Anthracite and semianthracite, <1,000 ft overburden

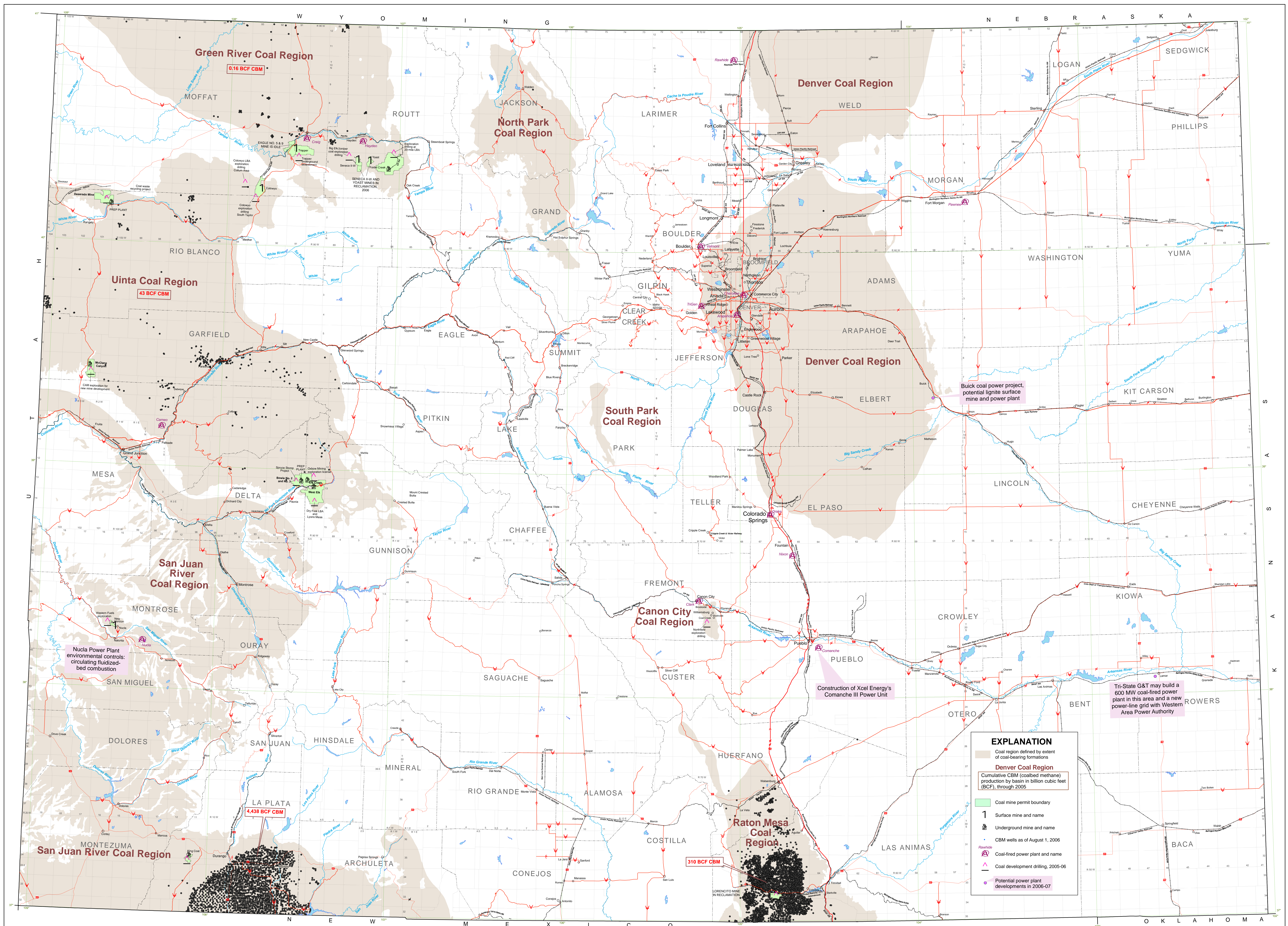
Note: Where there are multiple deep coal beds, the shallowest mineable bed is indicated.

Data sources: counties, highways, and railroads—Colorado Department of Transportation; township and range grid—Tolan International, Ltd.; coal basins and coal types—CGS Map Series 5, Coal Resource and Development Map of Colorado, 1976, by David C. Jones, Janet E. Schatz, and D. Keith Murray; active mines—Colorado Division of Minerals and Geology; power plants—power plant owners



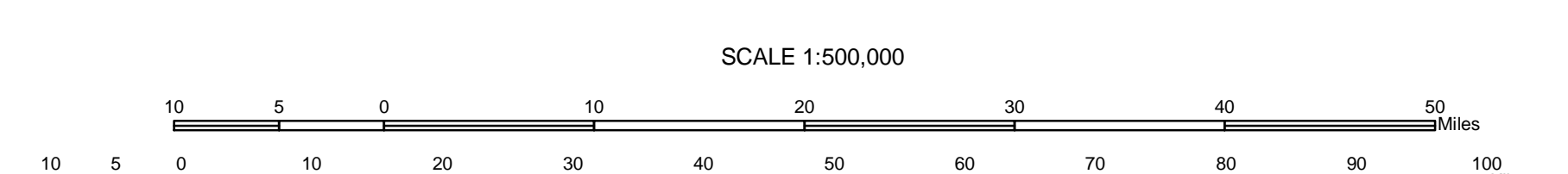
Coal Exploration and Development in Colorado, 2006

By Christopher J. Carroll



Data sources: counties, highways, and railroads—Colorado Department of Transportation; township and range—Twin International, Ltd.; coalbed methane wells—Colorado Oil and Gas Conservation Commission; power plants—power plant names—COGAS Map Series 8; Coal Resource Development Map of Colorado, 1978, by David C. Jones, Janet E. Schultz, and D. Keith Murray; active coal mines and permit boundaries—Colorado Division of Minerals and Geology

GIS and digital cartography by Cheryl Bachan



EXPLANATION

- LIGNITE WITH LESS THAN 150 FT. (46 M.) OF OVERBURDEN
 - LIGNITE WITH 150 FT. (46 M.) TO 1,000 FT. (305 M.) OF OVERBURDEN
 - SUBBITUMINOUS OR BITUMINOUS COAL WITH LESS THAN 150 FT. (46 M.) OF OVERBURDEN
 - SUBBITUMINOUS OR BITUMINOUS COAL WITH 150 FT. (46 M.) TO 3,000 FT. (910 M.) OF OVERBURDEN
 - BITUMINOUS COAL WITH MORE THAN 3,000 FT. (910 M.) OF OVERBURDEN
 - ANTHRACITE AND SEMIANTHRACITE
 - AREA OF PAST OR PRESENT COKING-COAL PRODUCTION
- DENVER REGION** COAL-BEARING REGION
 ESTIMATED ORIGINAL IN-PLACE RESOURCES TO 6,000 FT. (1820 M.),
 IN BILLIONS OF TONS: 42.47
 ESTIMATED RECOVERABLE IN-PLACE RESOURCES TO 6,000 FT. (1820 M.),
 IN BILLIONS OF TONS, AS OF 1/1/77: 42.36
- MINES AND PRELIMINARY 1977 PRODUCTION IN MILLION TONS
 (FOR MINES THAT PRODUCED > 0.25 MILLION TONS IN 1977)
- UNDERGROUND MINE (LICENSED AS OF DECEMBER 31, 1977)
 - ABANDONED UNDERGROUND MINE
 - SURFACE MINE (LICENSED AS OF DECEMBER 31, 1977)
 - ABANDONED SURFACE MINE
 - PROPOSED UNDERGROUND MINE
 - PROPOSED SURFACE MINE
 - COAL MINE EMITTING MEASURABLE AMOUNTS OF METHANE (M.E.S.A. DATA)
 - COKING PLANT
 - COAL WASHING PLANT
 - COAL WASHING PLANT UNDER CONSTRUCTION
 - PROPOSED COAL GASIFICATION PLANT (SURFACE)
 - PROPOSED IN-SITU COAL GASIFICATION PROJECT
 - PROPOSED METHANE RECOVERY PROJECT (COAL BED DEGASIFICATION)
 - COAL-FIRED ELECTRIC GENERATING PLANT WITH NAME OF PLANT AND AVAILABLE GENERATING CAPACITY IN MEGAWATTS
 - PROPOSED COAL-FIRED ELECTRIC GENERATING PLANT (UNDER CONSTRUCTION)
- COAL-BEARING FORMATION**
 GEOLGIC AGE
 COAL RANK (lv = MEDIUM-VOLATILE, hv = HIGH-VOLATILE)
- RAILROADS
 - GENERALIZED ROUTE OF PROPOSED RAILROAD
 - INDICATES ROUTE AND DIRECTION OF TRAVEL OF COAL UNIT TRAINS
 - INDICATES ROUTE AND DIRECTION OF TRAVEL OF FREIGHT TRAINS (EVOLVE MOVE) WHICH HAUL COAL
 - INDICATES ROUTE AND DIRECTION OF TRAVEL OF PROPOSED COAL UNIT TRAINS
 - COAL SLURRY PIPELINE (TENTATIVE PROPOSAL)
 - KNOWN COAL RESOURCE LEASING AREA (U.S.G.S.)

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U.S. Geological Survey and Colorado Geological Survey, 1977, Energy resources map of Colorado: U.S. Geol. Survey Misc. Inv. Ser. 1-1039, scale 1:500,000.

Personnel of the following governmental and private agencies have kindly provided important information used in the compilation of this map:

- Colorado Division of Mines, Department of Natural Resources
- U.S. Bureau of Land Management
- U.S. Bureau of Mines
- U.S. Geological Survey, Conservation Division
- U.S. Geological Survey, Geologic Division
- Colorado Public Utilities Commission
- Colorado Springs Department of Public Utilities
- Colorado Electric Association, Inc.
- Public Service Company of Colorado
- Southern Colorado Power Division, Central telephone and utilities Corp.
- Walsenburg Utilities
- Atchafalaya, Tonsa and Santa Fe Railway Co.
- Burlington Northern, Inc.
- Colorado and Southern Railway Co.
- Denver and Rio Grande Western Railroad Co.
- Union Pacific Railroad

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COAL RESOURCES AND DEVELOPMENT MAP
OF COLORADO