Chapter A

Executive Summary—The National Coal Resource Assessment Overview

Click here to return to Volume Table of Contents

By Kristin O. Dennen

Chapter A of
The National Coal Resource Assessment Overview
Edited by Brenda S. Pierce and Kristin O. Dennen

U.S. Geological Survey Professional Paper 1625–F

This report, although in the USGS Professional Paper series, is available only on CD–ROM

U.S. Department of the Interior
U.S. Geological Survey

U.S. Department of the Interior
KEN SALAZAR, Secretary

U.S. Geological Survey
Suzette M. Kimball, Acting Director

U.S. Geological Survey, Reston, Virginia: 2009

For more information on the USGS—the Federal source for science about the Earth, its natural and living resources, natural hazards, and the environment, visit http://www.usgs.gov or call 1-888-ASK-USGS

For an overview of USGS information products, including maps, imagery, and publications, visit http://www.usgs.gov/pubprod

To order this and other USGS information products, visit http://store.usgs.gov

Suggested citation:
Dennen, K.O., 2009, Executive summary—The National Coal Resource Assessment Overview, *in* Pierce, B.S., and Dennen, K.O., eds., The National Coal Resource Assessment Overview: U.S. Geological Survey Professional Paper 1625–F, Chapter A, 3 p.

Contents

Figure

Intentionally left blank.

Executive Summary—The National Coal Resource Assessment Overview

Kristin O. Dennen

The National Coal Resource Assessment

The National Coal Resource Assessment (NCRA) project was a multiyear effort by the U.S. Geological Survey (USGS) Energy Resources Program, in partnership with State geological surveys in the coal-producing regions, to identify, characterize, and assess the coal resources that will supply a major part of the Nation's energy needs during the next few decades. Coal beds and zones were assessed in five regions that account for more than 90 percent of the Nation's coal production—(1) the Appalachian Basin, (2) the Illinois Basin, (3) the Gulf Coast, (4) the Colorado Plateau, and (5) the Northern Rocky Mountains and Great Plains (fig. 1). The results of the NCRA are summarized in Chapter B of this overview (Mercier and Pierce) and in Ruppert and others (2002) along with a description of the methodology used in the NCRA.

The NCRA project differed in two fundamental ways from past USGS nationwide coal resource assessments (1) by utilizing digital databases and Geographic Information Systems (GIS) and (2) by focusing on both coal quantity and quality. All data were geographically referenced, stored, and manipulated digitally. These data include stratigraphic and geochemical databases for the fully assessed coal beds and zones in each coal region; coal extent, mined area, thickness, elevation, and overburden thickness maps; and geochemical maps of ash yield, sulfur content, calculated sulfur dioxide per million British thermal units (SO_2/MBtu) content, calorific value, and selected trace elements.

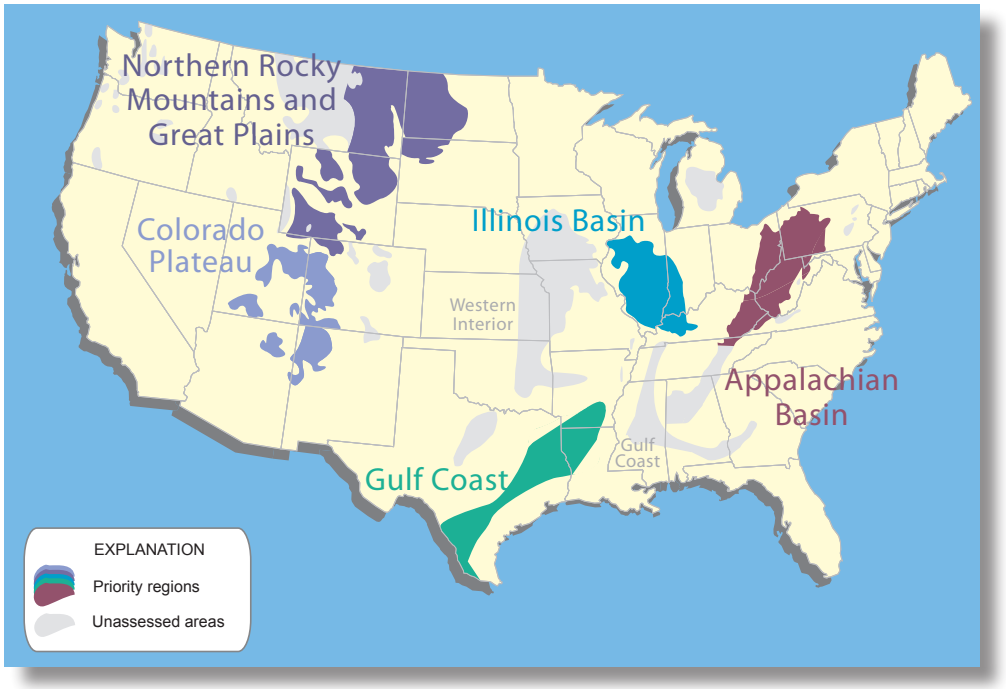


Figure 1. The five priority coal-producing regions in the United States assessed for the National Coal Resource Assessment.

The assessment results and GIS data for four of the five basins are publicly available online for downloading at the USGS NCRA Web sites:

USGS Fort Union Assessment Team, 1999, 1999 Resource assessment of selected Tertiary coal beds and zones in the Northern Rocky Mountains and Great Plains region: U.S. Geological Survey Professional Paper 1625–A, Version 1.2, Discs 1 and 2, [CD–ROM], available at *http://greenwood.cr.usgs.gov/energy/coal/PP1625A/*.

USGS Colorado Plateau Coal Assessment Team, 2000, Geologic assessment of coal in the Colorado Plateau—Arizona, Colorado, New Mexico, and Utah: U.S. Geological Survey Professional Paper 1625–B, Version 1.0, Appendix, [CD–ROM], available at *http://greenwood.cr.usgs.gov/energy/coal/PP1625B/*.

USGS Northern and Central Appalachian Basin Coal Regions Assessment Team, 2001, 2000 Resource assessment of selected coal beds and zones in the Northern and Central Appalachian Basin Coal regions: U.S. Geological Survey Professional Paper 1625–C, [CD–ROM], available at *http://pubs.usgs.gov/prof/p1625c/*.

Hatch, J.R., and Affolter, R.H., 2002, Resource assessment of the Springfield, Herrin, Danville and Baker Coals in the Illinois Basin: U.S. Geological Survey Professional Paper 1625–D, [CD–ROM], available at *http://greenwood.cr.usgs.gov/energy/coal/pp1625d/*.

Coal bed gas and oil assessment results for the Gulf Coast region are available in this fact sheet:

Warwick, P.D., Charpentier, R.R., Cook, T.A., Klett, T.R., Pollastro, R.M., and Schenk, C.J., 2007, Assessment of undiscovered oil and gas resources in Cretaceous-Tertiary coal beds of the Gulf Coast region, 2007: U.S. Geological Survey Fact Sheet 2007–3039, 2 p., available at *http://pubs.usgs.gov/fs/2007/3039/*

In addition, studies of coal resources on Federal lands in the five priority regions were also conducted. These studies were done because approximately one-third of the Nation's coal production comes from Federal lands. The results are presented in the following Federal Lands Fact Sheets and can be downloaded from the USGS NCRA Web site:

Ellis, M.S., Molnia, C.L., Biewick, L.H., Roberts, L.N.R., Flores, R.M., Roberts, S.B., Stricker, G.D., and Ochs, A.M., 2000, Federally owned coal and Federal lands in the Northern Rocky Mountains and Great Plains Region: U.S. Geological Survey Fact Sheet FS–011–00, available at *http://pubs.usgs.gov/fs/fs-0011-00/*.

Molnia, C.L., Roberts, L.N.R., Biewick, L.R.H., Affolter, R.H., Brownfield, M.E., Dubiel, R.F., Fassett, J.E., Hettinger, R.D., and Johnson, E.A., 2001, Federally owned coal, Federal lands, and coal quality in the Colorado Plateau Region: U.S. Geological Survey Fact Sheet FS–0011–01, available at *http://pubs.usgs.gov/fs/fs-0011-01/*.

Karlsen, A.W., SanFilipo, J.R., Warwick, P.D., 2002, Coal underlying Federal lands in the Gulf of Mexico Coastal Plain: U.S. Geological Survey Fact Sheet 094–02, available at *http://pubs.usgs.gov/fs/fs094-02/*.

Tewalt, S.J., 2001, Resources on Federal lands for five coal beds in the Northern and Central Appalachian Basin Coal Regions: U.S. Geological Survey Open-File Report 2001–178, available at *http://pubs.usgs.gov/of/2001/of01-178/*.

The National Coal Resource Assessment Overview

The purpose of this Professional Paper, USGS Professional Paper 1625–F, is to present a tabulation of the assessment results (this volume, Chapter B), insight into the methods used in the NCRA and complementary information on coal quality, economics, and other factors that currently affect coal production in the United States.

A critical issue affecting the use and economic viability of any coal deposit is the quality of the coal distributed in and throughout a particular coal bed. Each coal-quality parameter is significant for a different reason—such as environmental concerns, boiler performance, and energy generated from the coal. A description of coal quality parameters and a discussion of epidemiological research and environmental regulations are given by Schweinfurth in "An Introduction to Coal Quality (this volume, Chapter C).

It is essential to understand the differences between coal resources and coal reserves when evaluating coal resource assessments. Coal resources include those in-place tonnage estimates determined by summing the volumes for identified and hypothetical coal beds and coal zones of a minimum thickness and within certain depth limits (commonly 0–2,000 ft deep). Coal reserves, a subset of the coal resources, are considered economically producible at the time of classification. Luppens and others (this volume, Chapter D) discuss the terms "resources" and "reserves" and summarize how coal availability and resource studies (CARS) are used to determine estimates of economically recoverable coal resources.

More than 90 percent of the coal consumed in the United States is used for electric power production, and the demand for electricity is constantly increasing. One of the biggest challenges the electric power industry faces is to supply enough electricity to meet the growing demand while reducing airborne emissions from powerplants. Attanasi and Freeman (this volume, Chapter E) analyze the forces shaping the modern electric power-generating industry coal market and the mining industry's ability to reliably supply economic quantities of coal.

Comparing coal resources across beds, lithologies, and regions in the United States requires a rigorous geostatistical method for estimating uncertainty in volumes of coal. Schuenemeyer and others (this volume, Chapter F) show how uncertainty in resource estimates for the historical categories of geological assurance coal categories (measured, indicated, inferred, and hypothetical) was computed, using the Harmon coal bed in southwestern North Dakota as a model.

Coal cleaning is one method of processing an otherwise uneconomic coal to make it compliant with the electric power industry's standards and environmental regulations. Estimating the cost of this process requires knowledge of the coal's quality, how it will respond to treatment, and what technology is used in mining and cleaning. Bhagwat and others (this volume, Chapter G) describe an interactive software package they developed for the purpose of estimating coal cleaning costs.

For almost 100 years, more than 90 percent of the Nation's coal was produced from just two coal basins, the Appalachian and Illinois Basins; yet these two basins are currently producing less than one-half the Nation's coal. Milici and Dennen (this volume, Chapter H) describe the history of coal production in these two important regions, discuss reasons for the decline in production, and provide projections for rates of depletion of economically recoverable coal resources in the two basins.

Conclusions

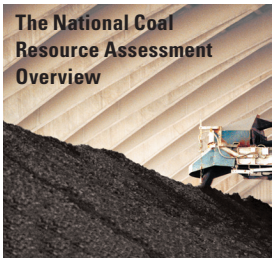
The results of the USGS NCRA are important because they provide an impartial assessment of the Nation's coal resources. This information can be used to:

- Evaluate environmental impacts related to the extraction, production, and use of coal.
- Manage resources on Federal lands.
- Address issues of energy policy, energy strategy, reliable and cost-effective energy supplies, land-use management, environmental policy, economic projections, and human health policy.
- Determine the potential for coalbed-gas (methane) resources and development in the United States.
- Determine the availability and recoverability of coal resources throughout the United States.
- Determine potential areas of future coal and coalbed-gas development.
- Assess potential storage sites and volumes of coal that could be used to sequester carbon dioxide.

The basic coal and related information contained in this volume will help enable citizens and government to manage effectively in a changing technological and environmental landscape.

Reference

Ruppert, L.F., Kirschbaum, M.A., Warwick, P.D., Flores, R.M., Affolter, R.H., and Hatch, J.R., 2002, The U.S. Geological Survey's national coal resource assessment—The results: International Journal of Coal Geology, v. 50, p. 247–274.



Click here to return to Volume Table of Contents