

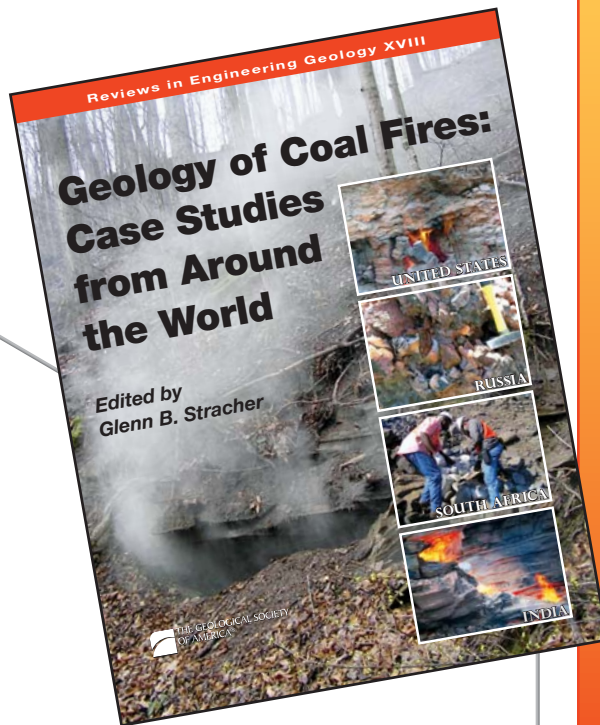
Geology of Coal Fires: Case Studies from Around the World

Edited by Glenn B. Stracher

Geology of Coal Fires: Case Studies from Around the World is The Geological Society of America's first publication devoted to "coal-fires science," an exciting and interdisciplinary area of research gaining international attention in recent years. Coal fires are preserved globally in the rock record as burnt and volume-reduced coal seams and by pyrometamorphic rocks, explosion breccias, clinker, gas-vent-mineral assemblages, fire-induced faulting, ground fissures, slump blocks, and sinkholes. Coal fires are responsible for coronary and respiratory diseases and fatalities in humans, as well as arsenic and fluorine poisoning. Their heat energy, toxic fumes, and solid by-products of combustion destroy floral and faunal habitats while polluting the air, water, and soil. This exciting volume includes chapters devoted to spontaneous combustion and greenhouse gases, gas-vent mineralogy and petrology, paralavas and combustion metamorphic rocks, geochronology and landforms, magnetic signatures and geophysical modeling, remote-sensing detection and fire-depth estimation of concealed fires, and coal fires and public policy.

REG018, 278 p. plus index, ISBN 9780813741185, price \$49.00 (sorry, no additional discounts)

BOOK PRICE • BOOK PRICE • BOOK PRICE
\$49
BOOK PRICE • BOOK PRICE • BOOK PRICE



THE
GEOLOGICAL
SOCIETY
OF AMERICA®

GSA Sales and Service P.O. Box 9140, Boulder, CO 80301-9140, USA
+1.303.357.1000, option 3 • +1.888.443.4472 • fax +1.303.357.1071 (24-hour line)

AVAILABLE AT THE GSA BOOKSTORE

→ or at www.geosociety.org/bookstore

Testimonials

“A solid introduction to the broad topic [of coal fires] and ... essential reading for anyone embarking in further studies in this broad discipline.”

—James C. Hower, *International Journal of Coal Geology*

“I would not be surprised if this beautifully illustrated book re-kindled interest in efforts to better understand the phenomenon of uncontrolled coal fires, eventually leading to global efforts to extinguish those that are burning and protocols to prevent future fires.”

—Robert B. Finkelman,
University of Texas at Austin



Photos courtesy of Glenn B. Stracher, Ellina V. Sokol, and Victor V. Sharigin.

Contents

Preface

Acknowledgments

Illustrations of coal fires

SPONTANEOUS COMBUSTION AND GREENHOUSE GASES

1. *Greenhouse gases generated in underground coal-mine fires*
Ann G. Kim
2. *The spontaneous combustion index and its application: Past, present, and future*
Sezer Uludağ
3. *Geological models of spontaneous combustion in the Wuda coalfield, Inner Mongolia, China*
Daiyong Cao, Xinjie Fan, Haiyan Guan, Chacha Wua, Xiaolei Shi, and Yuerong Jia
4. *Survey of recent experimental work on the self-heating and spontaneous combustion of coal*
Mark Nelson and Xiao Dong Chen
5. *A laboratory study of a reactive surface layer for the prevention of spontaneous combustion*
Rufaro Kaitano, David Glasser, and Diane Hildebrandt

MINERALOGY AND PETROLOGY

6. *The origin of gas-vent minerals: Isochemical and mass-transfer processes*
Glenn B. Stracher
7. *Combustion metamorphic events resulting from natural coal fires*
Ellina V. Sokol and Nina I. Volkova
8. *Mineralogy and petrography of iron-rich slags and paralavas formed by spontaneous coal combustion, Rotowaro coalfield, North Island, New Zealand*
M. Naze-Nancy Masalehdani, Philippa M. Black, and Huldrych W. Kobe
9. *Paralavas in a combustion metamorphic complex: Hatrurim Basin, Israel*
Yevgeny Vapnik, Victor V. Sharygin, Ella V. Sokol, and Reginald Shagam
10. *Geochronology of clinker and implications for evolution of the Powder River Basin landscape, Wyoming and Montana*
Edward L. Heffern, Peter W. Reiners, Charles W. Naeser, and Donald A. Coates

GEOPHYSICS—MODELING

11. *Possible sources of magnetic anomalies over thermally metamorphosed carbonate rocks of the Mottled Zone in Israel*
Boris Khesin, Shimon Feinstein, and Sophia Itkis
12. *Detecting concealed coal fires*
Hartwig Gielisch
13. *Subsurface coal-mine fires: Laboratory simulation, numerical modeling, and depth estimation*
Anupma Prakash and Antony R. Berthelote

GEOPHYSICS—REMOTE SENSING

14. *Remotely sensed land-cover changes in the Wuda and Rugigou-Gulaben coal-mining areas of China*
Claudia Kuenzer, Jianzhong Zhang, Stefan Voigt, and Wolfgang Wagner
 15. *Remote-sensing-based coal-fire detection with low-resolution MODIS data*
Christoph Hecker, Claudia Kuenzer, and Jianzhong Zhang
 16. *Application of remote sensing in coal-fire studies and coal-fire-related emissions*
Prasun K. Gangopadhyay
 17. *Three-dimensional thermal-imaging methodology for detecting underground coal fires*
Zhang Jianmin, Huan Zhongdan, Sun Yujing, Tian Yuan, Stefan Voigt, and Zhao Xuejun
- ## COAL FIRES AND PUBLIC POLICY
18. *Comparison of Pennsylvania anthracite mine fires: Centralia and Laurel Run*
Melissa A. Nolter, Daniel H. Vice, and Harold Aurand Jr.
 19. *Congressional response to coal fires: Illustrating transitions in the policy process*
Karen M. McCurdy

Index