Contents

Part I  Deep-Sea Minerals: Distribution Characteristics and Their Resource Potential

1 Deep-Sea Mining: Current Status and Future Considerations .......... 3
   Rahul Sharma

2 Composition, Formation, and Occurrence of Polymetallic Nodules ................................................................. 23
   T. Kuhn, A. Wegorzewski, C. Rühlemann, and A. Vink

3 Marine Co-Rich Ferromanganese Crust Deposits:
   Description and Formation, Occurrences and Distribution,
   Estimated World-wide Resources ..................................................... 65
   Peter E. Halbach, Andreas Jahn, and Georgy Cherkashov

4 Seafloor Massive Sulfide Deposits: Distribution and Prospecting..... 143
   Georgy Cherkashov

5 Submarine Phosphorites: The Deposits of the Chatham Rise,
   New Zealand, off Namibia and Baja California, Mexico—Origin,
   Exploration, Mining, and Environmental Issues .............................. 165
   Hermann Kudrass, Ray Wood, and Robin Falconer

6 Predictive Mapping of the Nodule Abundance
   and Mineral Resource Estimation in the Clarion-Clipperton
   Zone Using Artificial Neural Networks and Classical
   Geostatistical Methods .................................................................. 189
   Andreas Knobloch, Thomas Kuhn, Carsten Rühlemann,
   Thomas Hertwig, Karl-Otto Zeissler, and Silke Noack

7 Statistical Properties of Distribution of Manganese Nodules
   in Indian and Pacific Oceans and Their Applications in Assessing
   Commonality Levels and in Exploration Planning ............................ 213
   T.R.P. Singh and M. Sudhakar


8 Assessment of Distribution Characteristics of Polymetallic Nodules and Their Implications on Deep-Sea Mining ......................... 229
Rahul Sharma

Part II Deep-Sea Mining Technology: Concepts and Applications

9 Fundamental Geotechnical Considerations for Design of Deep-Sea Mining Systems ....................................................... 259
Tetsuo Yamazaki

10 Concepts of Deep-Sea Mining Technologies ........................................ 305
M.A. Atmanand and G.A. Ramadass

11 An Application of Ocean Mining Technology: Deep Ocean Water Utilization ......................................................... 345
Koji Otsuka and Kazuyuki Ouchi

Part III Metallurgical Processing and Their Sustainable Development

12 Metallurgical Processing of Polymetallic Ocean Nodules .............. 365
R.P. Das and S. Anand

13 Sustainable Processing of Deep-Sea Polymetallic Nodules ............ 395
P.K. Sen

John C. Wiltshire

Part IV Environmental Concerns of Impact of Deep-Sea Mining

15 Recent Developments in Environmental Impact Assessment with Regard to Mining of Deep-Sea Mineral Resources .......... 445
Y. Shirayama, H. Itoh, and T. Fukushima

16 Taxonomic Problems in Environmental Impact Assessment (EIA) Linked to Ocean Mining and Possibility of New Technology Developments ........................................ 465
Tomohiko Fukushima and Miyuki Nishijima

17 Development of Environmental Management Plan for Deep-Sea Mining ................................................................. 483
Rahul Sharma

18 The Crafting of Seabed Mining Ecosystem-Based Management ................................................................. 507
Yves Henocque

Index ........................................................................................................... 527
Deep-Sea Mining
Resource Potential, Technical and Environmental Considerations
Sharma, R. (Ed.)
2017, X, 535 p. 270 illus., 131 illus. in color., Hardcover
ISBN: 978-3-319-52556-3