Acknowledgments xiii Praise for the book Preamble xvii Overview: roadmap to environmental literacy xviii Legend of the roadmap xxii Part I Invention of the environment:

origins, transdisciplinarity, and theory of science perspectives 1 What knowledge about what

environment? 3 2 From environmental literacy to transdisciplinarity 15

List of boxes

3 Basic epistemological assumptions 29

Part II History of mind of biological knowledge 4 Emerging knowledge on morphology,

ecology, and evolution 45 From molecular structures to ecosystems Part III Contributions of psychology

6 Psychological approaches to humanenvironment interactions 137

Drivers of individual behavior 190 Part IV Contributions of sociology

Traditional sociological approaches to

human-environment interactions 215

Modern sociological approaches to human-environment interactions 231

Part V Contributions of economics 10 Origins of economic thinking and the environment 257 11 Contemporary economic theories dealing with the environment 281

Part VI Contributions of industrial

ecology 12 The emergence of industrial ecology 307 13 Industrial agents and global biogeochemical dynamics 320

Part VII Beyond disciplines and sciences 14 Integrated systems modeling of complex human-environment systems 341

Roland W. Scholz, Justus Gallati, Quang Bao Le, and Roman Seidl

94

15 Transdisciplinarity for environmental literacy 373

Part VIII A framework for investigating human—environment systems (HES)

- 16 The HES Postulates 407
- 17 The HES framework 453 Roland W. Scholz, Claudia R. Binder, and Daniel J. Lang
- 18 Applying the HES framework 463 Roland W. Scholz, Claudia R. Binder, Daniel J. Lang, Timo Smieszek, and Michael Stauffacher
- 19 Comparing the HES framework with alternative approaches 509
 Roland W. Scholz and Fridolin Brand

Part IX Perspectives for environmental literacy

20 New horizons: environmental and sustainability sciences 525

Glossary 537 References 551 Index 626