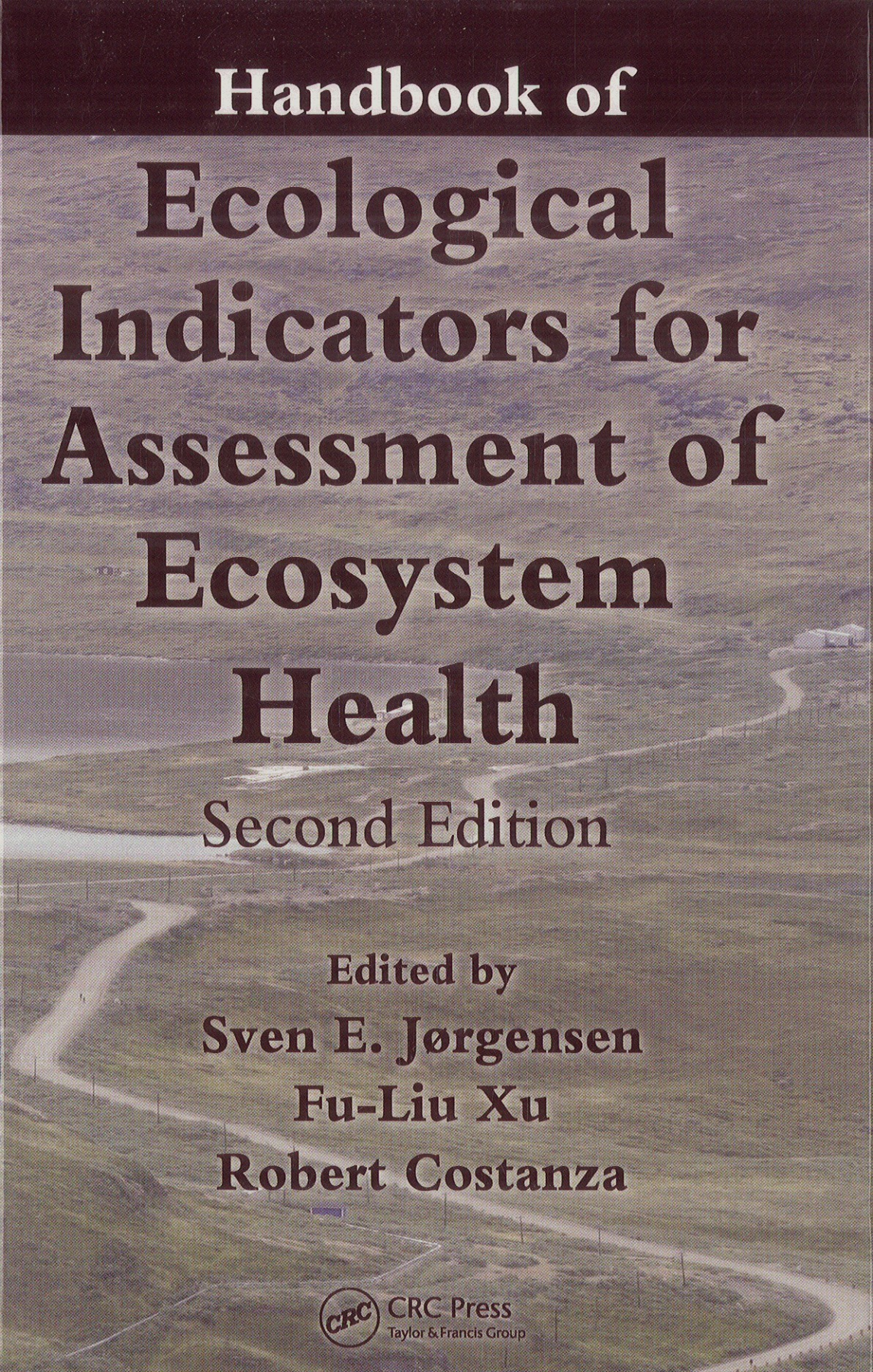


The background of the cover is an aerial photograph of a coastal landscape. A winding road or path curves through a green, hilly area towards a body of water on the left. The sky is a pale, hazy blue.

Handbook of Ecological Indicators for Assessment of Ecosystem Health

Second Edition

**Edited by
Sven E. Jørgensen
Fu-Liu Xu
Robert Costanza**



CRC Press
Taylor & Francis Group

Contents

Preface.....	vii
Editors.....	ix
Contributors.....	xi

Section I Ecological Indicators

1. Introduction.....	3
<i>S. E. Jørgensen</i>	
2. Application of Indicators for the Assessment of Ecosystem Health.....	9
<i>S. E. Jørgensen, Fu-Liu Xu, João C. Marques, and Fuensanta Salas</i>	
3. Eco-Exergy as Ecological Indicator	77
<i>S. E. Jørgensen</i>	
4. Emergy Indices of Biodiversity and Ecosystem Dynamics	89
<i>Mark T. Brown and Sergio Ulgiati</i>	
5. Eco-Exergy to Emergy Flow Ratio for the Assessment of Ecosystem Health.....	113
<i>F. M. Pulselli, C. Gaggi, and S. Bastianoni</i>	
6. Natural Capital Security/Vulnerability Related to Disturbance in a Panarchy of Social-Ecological Landscapes.....	125
<i>Nicola Zaccarelli, Irene Petrosillo, and Giovanni Zurlini</i>	
7. Species Richness in Space and Time as an Indicator of Human Activity and Ecological Change	149
<i>Erich Tasser, Georg Niedrist, Patrick Zimmermann, and Ulrike Tappeiner</i>	
8. Landscape Development Intensity and Pollutant Emergy/Empower Density Indices as Indicators of Ecosystem Health.....	171
<i>Mark T. Brown and Kelly Chinnners Reiss</i>	
9. Ecosystem Services and Ecological Indicators	189
<i>Robert Costanza</i>	

Section II Assessment of Ecosystem Health

10. Application of Ecological Indicators for the Assessment of Wetland Ecosystem Health	201
<i>S. E. Jørgensen</i>	
11. Application of Ecological Indicators for the Assessment of Ecosystem Health in Estuaries and Coastal Zones	211
<i>João C. Marques, Fuensanta Salas, J. Patrício, J. Neto, H. Teixeira, and R. Pinto</i>	
12. Application of Ecological and Thermodynamic Indicators for the Assessment of Ecosystem Health of Lakes	263
<i>Fu-Liu Xu</i>	
13. Application of Ecological Indicators in Forest Management in Africa	301
<i>Kouami Kokou, Adzo Dzifa Kokutse, and Kossi Adjonou</i>	
14. Using Ecological Indicators to Assess the Health of Marine Ecosystems: The North Atlantic	335
<i>Villy Christensen and Philippe Cury</i>	
15. Indicators for the Management of Coastal Lagoons: Sacca di Goro Case Study	357
<i>J. M. Zaldívar, M. Austoni, M. Plus, G. A. De Leo, G. Giordani and P. Viaroli</i>	
16. Ecosystem Indicators for the Integrated Management of Landscape Health and Integrity	391
<i>Felix Müller and Benjamin Burkhard</i>	
17. Integrated Indicators for Evaluating Ecosystem Health: An Application to Agricultural Systems	425
<i>V. Niccolucci, R. M. Pulselli, S. Focardi, and S. Bastianoni</i>	
18. Ecological Indicators to Assess the Health of River Ecosystems.....	447
<i>Carles Ibáñez, Nuno Caiola, Peter Sharpe, and Rosa Trobajo</i>	
Appendix	465
Index	467