CONTENTS OF ALL VOLUMES

VOLUME 1: GIS METHODS AND TECHNIQUES

New Perspectives on GIS (Multidisciplinary)

1.01 The Future Development of GISystems, GIScience, and GIServices 1
Ming-Hsiang Tsou

1.02 Geocomputation: Data, Methods, and Applications in a New Era 5
Shaun Fontanella and Ningchuan Xiao

Data Management

1.03 Big Geodata 19
Michael F Goodchild

1.04 Current Themes in Volunteered Geographic Information 26
Colin J Ferster, Trisalyn Nelson, Colin Robertson, and Rob Feick

1.05 Open Data and Open Source GIS 42
Xinyue Ye

1.06 GIS Databases and NoSQL Databases 50
Peng Yue and Zhenyu Tan

1.07 Geospatial Semantics 80
Yingjie Hu

1.08 Geocoding and Reverse Geocoding 95
Dapeng Li

1.09 Metadata and Spatial Data Infrastructure 110
Scott Simmons

Spatial Analysis and Modeling

1.10 Spatial Analysis Methods 125
David W S Wong and Fahui Wang

1.11 Big Data Analytic Frameworks for GIS (Amazon EC2, Hadoop, Spark) 148
Chen Xu

1.12 Network Analysis 153
Kevin M Curtin

1.13 Analysis and Modeling of Movement 162
Paul Holloway and Jennifer A Miller

1.14 Spatial Metrics: The Static and Dynamic Perspectives 181
Saad Saleem Bhatti, José Pedro Reis, and Elisabete A Silva

1.15 Multicriteria Analysis 197
Jacek Malczewski

1.16 Agent-Based Modeling 218
Andrew Crooks, Alison Heppenstall, and Nick Malleson

1.17 Spatial Optimization for Sustainable Land Use Planning 244
Kai Cao

1.18 Geostatistical Approach to Spatial Data Transformation 253
Eun-Hye Yoo

Space-Time GIS

1.19 Spatial and Spatiotemporal Data Mining 264
Shashi Shekhar, Yan Li, Reem Y Ali, Emre Eftelioglu, Xun Tang, and Zhe Jiang

1.20 Space-Time GIS and Its Evolution 287
Atsushi Nara

1.21 Time Geography 303
Jie Dai and Li An

Spatial Data Quality

1.22 Spatial Data Uncertainty 313
Linna Li, Hyowon Ban, Suzanne P Wechsler, and Bo Xu

Cyberinfrastructure and GIS

1.23 Cyberinfrastructure and High-Performance Computing 341
Xuan Shi and Miaoqing Huang

Virtual GIS

1.24 Augmented Reality and GIS 355
Nick Hedley

1.25 GIS and Serious Games 369
Brian Tomaszewski, Angelina Konovitz-Davern, David Schwartz, Joerg Szarzynski, Lena Siedentopp, Ashely Miller, and Jacob Hartz

Mobile GIS

1.26 Mobile GIS and Location-Based Services 384
Song Gao and Gengchen Mai

Jeremy W Crampton, Eric M Huntley, and Emily C Kaufman

1.28 Geoprivacy 415
Marc P Armstrong, Ming-Hsiang Tsou, and Dara E Seidl

1.29 Defining Public Participation GIS 431
Rina Ghose

GIS Design and Project Management

1.30 User-Centered Design for Geoinformation Technologies 438
Sven Fuhrmann

1.31 GIS Project Management 446
Jochen Albrecht

VOLUME 2: GIS APPLICATIONS FOR ENVIRONMENT AND RESOURCES

GIS for Biophysical Environment

2.01 GIS for Mapping Vegetation 1
Georg Bareth and Guido Waldhoff

2.02 GIS for Paleo-limnological Studies 28
Yongwei Sheng, Austin Madson, and Chunqiao Song

2.03 GIS and Soil 37
Federica Lucà, Gabriele Buttafuoco, and Oreste Terranova

2.04 GIS for Hydrology 51
Wolfgang Korres and Karl Schneider

2.05 GIS Applications in Geomorphology 81
Jan-Christoph Otto, Günther Prasicek, Jan Blöthe, and Lothar Schrott

2.06 GIS for Glaciers and Glacial Landforms 112
Tobias Bolch and David Loibl

2.07 GIS and Remote Sensing Applications in Wetland Mapping and Monitoring 140
Qiusheng Wu

GIS for Resources

2.08 GIS for Natural Resources (Mineral, Energy, and Water) 158
Wendy Zhou, Matthew D Minnick, and Celena Cui

GIS for Energy

2.09 GIS for Urban Energy Analysis 187
Chaosu Li

GIS and Climate Change

2.10 GIS in Climatology and Meteorology 196
Jürgen Böhner and Benjamin Bechtel

2.11 GIS and Coastal Vulnerability to Climate Change 236
Sierra Woodruff, Kristen A Vitro, and Todd K BenDor

GIS for Disaster Management

2.12 Assessment of GIS-Based Machine Learning Algorithms for Spatial Modeling of Landslide Susceptibility: Case Study in Iran 258
Alireza Motevalli, Hamid Reza Pourghasemi, and Mohsen Zabihi

2.13 Data Integration and Web Mapping for Extreme Heat Event Preparedness 281
Bev Wilson

GIS for Agriculture and Aquaculture

2.14 GIS Technologies for Sustainable Aquaculture 290
Lynne Falconer, Trevor Telfer, Kim Long Pham, and Lindsay Ross

2.15 An Integrated Approach to Promote Precision Farming as a Measure Toward Reduced-Input Agriculture in Northern Greece Using a Spatial Decision Support System 315
Thomas K Alexandridis, Agamemnon Andrianopoulos, George Galanis, Eleni Kalopesa, Agathoklis Dimitrakos, Fotios Katsogiannos, and George Zalidis

GIS for Land Use and Transportation Planning

2.16 GIS and Placemaking Using Social Media Data 353
Yan Chen

2.17 GIS and Scenario Analysis: Tools for Better Urban Planning 371
Arnab Chakraborty and Andrew McMillan

2.18 Transit GIS 381
Qisheng Pan, Ming Zhang, Zhengdong Huang, and Xuejun Liu

2.19 Modeling Land-Use Change in Complex Urban Environments 401
Brian Deal, Haozhi Pan, and Youshan Zhuang

2.20 Application of GIS-Based Models for Land-Use Planning in China 424
Huang Xianjin, Li Huan, He Jinliao, and Zong Yueguang

2.21 GIS Graph Tool for Modeling: Urban–Rural Relationships 446
Paulo Morgado, Patrícia Abrantes, and Eduardo Gomes

VOLUME 3: GIS APPLICATIONS FOR SOCIO-ECONOMICS AND HUMANITY

GIS for Economics

3.01 GIS and Spatial Statistics/Econometrics: An Overview 1
Daniel A Griffith and Yongwan Chun

3.02 Estimating Supply Elasticities for Residential Real Estate in the United Kingdom 27
Thies Lindenthal

3.03 Forced Displacement and Local Development in Colombia: Spatial Econometrics Analyses 42
Néstor Garza and Sandra Rodriguez

3.04 Searching for Local Economic Development and Innovation: A Review of Mapping Methodologies to Support Policymaking 59
Alexander Kleibrink and Juan Mateos

3.05 An Agent-Based Model of Global Carbon Mitigation Through Bilateral Negotiation Under Economic Constraints: The Key Role of Stakeholders' Feedback and Facilitated Focus Groups and Meetings in the Development of Behavioral Models of Decision-Making 69
Douglas Crawford-Brown, Helin Liu, and Elisabete A Silva

GIS for Business and Management

3.06 GIS-Based Approach to Analyze the Spatial Opportunities for Knowledge-Intensive Businesses 83
Mei Lin Yeo, Saad Saleem Bhatti, and Elisabete A Silva

GIS for History

3.07 GIS for History: An Overview 101
N Jiang and D Hu

3.08 PastPlace Historical Gazetteer 110
Humphrey Southall, Michael Stoner, and Paula Aucott

3.09 Collaborative Historical Information Analysis 119
Patrick Manning, Pieter François, Daniel Hoyer, and Vladimir Zadorozhny

3.10 A Review on the Current Progress in Chinese Historical GIS Research 145
Peiyao Zhang, Ning Bao, and Kai Cao

GIS for Linguistics

3.11 GIS in Linguistic Research 152
Jay Lee, Jiajun Qiao, and Dong Han

3.12 GIS in Comparative-Historical Linguistics Research: Tai Languages 157
Wei Luo, John Hartmann, Fahui Wang, Huang Pingwen, Vinya Sysamouth, Jinfeng Li, and Xuezhi Cang

GIS for Politics

3.13 Spatial Dimensions of American Politics 181
Iris Hui and Wendy K Tam Cho

3.14 GIS-Enabled Mapping of Electoral Landscape of Support for Political Parties in Australia 189
Robert J Stimson, Prem Chhetri, and Tung-Kai Shyy

GIS for Law and Regulations

3.15 A Global Administrative Solution to Title and Tenure Insecurity: The Implementation of a Global Title and Rights Registry 257
C Kat Grimsley

GIS for Human Behavior

3.17 Urban Dynamics and GIScience 297
Chenghu Zhou, Tao Pei, Jun Xu, Ting Ma, Zide Fan, and Jianghao Wang

3.18 Sensing and Modeling Human Behavior Using Social Media and Mobile Data 313
Abhinav Mehrotra and Mirco Musolesi

3.19 GIS-Based Social Spatial Behavior Studies: A Case Study in Nanjing University Utilizing Mobile Data 320
Bo Wang, Feng Zhen, Xiao Qin, Shoujia Zhu, Yupei Jiang, and Yang Cao

3.20 The Study of the Effects of Built Form on Pedestrian Activities: A GIS-Based Integrated Approach 330
Ye Zhang, Ying Jin, Koen Steemers, and Kai Cao

3.21 The Fusion of GIS and Building Information Modeling for Big Data Analytics in Managing Development Sites 345
Weisheng Lu, Yi Peng, Fan Xue, Ke Chen, Yuhan Niu, and Xi Chen

GIS for Evidence-Based Policy Making

3.22 Smarter Than Smart Cities: GIS and Spatial Analysis for Socio-Economic Applications That Recover Humanistic Media and Visualization 360
Annette M Kim

3.23 Comparing Global Spatial Data on Deforestation for Institutional Analysis in Africa 371
Aiora Zabala

3.24 Constructing a Map of Physiological Equivalent Temperature by Spatial Analysis Techniques 389
Poh-Chin Lai, Pui-Yun Paulina Wong, Wei Cheng, Thuan-Quoc Thach, Crystal Choi, Man Sing Wong, Alexander Krämer, and Chit-Ming Wong

3.25 GIS-Based Accessibility Analysis of Health-Care Facilities: A Case Study in Hong Kong 402
Wenting Zhang, Kai Cao, Shaobo Liu, and Bo Huang

3.26 From Base Map to Inductive Mapping—Three Cases of GIS Implementation in Cities of Karnataka, India 411
Christine Richter

3.27 Using GIS to Understand Schools and Neighborhoods 422
Linda Loubert

Index 441