

Contents

Foreword	xi
Colette CAUVIN-REYMOND	
Introduction	xvii
Claire CUNTY and H�el�ene MATHIAN	
Chapter 1. Exploring Statistical Relationships with Maps and Charts	1
Jean-Beno�t BOURON, Claire CUNTY, H�el�ene MATHIAN and Myriam BARON	
1.1. Introduction.	1
1.2. Mapping the world: which world? what data?	4
1.2.1. Planispheres, projections and centers	5
1.2.2. Grid-related issues	7
1.2.3. Data at global scale: a composite material	9
1.3. Exploring data and relationships with maps and charts	11
1.3.1. Exploring statistical relationships and spatial organizations	12
1.3.2. Formalizing a relationship: from a statistical model to the map of model deviations	16
1.4. Describing statistical relationships between several variables	18
1.5. Conclusion	25
1.6. References	26

Chapter 2. Heterogeneous Data Integration and Geoweb Cartographic Representations	29
Marianne GUÉROIS and Malika MADELIN	
2.1. Introduction.	29
2.2. New data: from production to visualization	32
2.2.1. New data production methods and new scientific applications	33
2.2.2. Data with high spatial and temporal resolution but poorer attributes and quality?	35
2.2.3. Visualizing new data on Web platforms	41
2.3. New data, traditional data: why and how to integrate them?	45
2.3.1. Data heterogeneity, integration, interoperability: preamble to vocabulary development	46
2.3.2. Visual overlay of heterogeneous data, facilitated by advances in technical interoperability	48
2.3.3. Term-to-term matching to assess the quality and enrich the attributes of new data	50
2.3.4. Aggregations for combining heterogeneous data within “pivotal” spatiotemporal units	52
2.3.5. Interpolated data measuring two continuous phenomena to compare them within a common grid	55
2.4. Conclusion	59
2.5. References	61
Chapter 3. Environmental Data and Cartographic Objects	65
Étienne COSSART	
3.1. Introduction.	65
3.1.1. Defining cartographic objects: positioning the problem	65
3.1.2. Specific environmental data.	66
3.2. Building cartographic objects: deconstructing to reconstruct.	67
3.2.1. From geographic object to cartographic object.	67
3.2.2. A few reminders on set theory	68
3.2.3. Defining objects and collecting data	71
3.3. Dealing with disparate and incomplete data: examples from environmental geography	74
3.3.1. Defining cartographic objects from incomplete data	74
3.3.2. Defining cartographic objects at reference scales	82
3.4. Conclusion	86
3.5. References	87

Chapter 4. Mapping and Identifying Geographic Configurations: The Example of Segregation	89
Sylvestre DUROUDIER	
4.1. Introduction.	89
4.2. Mapping: rendering spatial configurations visible or invisible.	91
4.2.1. Defining the study framework	91
4.2.2. The scale of spatial configurations: a question of geographic mesh	93
4.2.3. How the map is created	99
4.3. How to measure a phenomenon so as to reveal its forms	104
4.3.1. The dependence of measures to the definition of categories.	104
4.3.2. The indices approach.	107
4.3.3. Multivariate analysis approach: qualifying segregated neighborhoods.	112
4.4. Capturing spatial forms using dynamic approaches	116
4.4.1. Why a dynamic approach to spatial morphologies?	116
4.4.2. Approaches using spatial indices or spatial autocorrelation	117
4.4.3. Approach based on discontinuities.	120
4.4.4. Approach based on population potential	122
4.5. Conclusion	125
4.6. References	126
Chapter 5. Map and Statistical Model to Explore Spatial Heterogeneity	131
Mohamed HILAL and Julie LE GALLO	
5.1. Introduction.	131
5.2. From raw open-source data to statistical data.	133
5.2.1. Open-source data with a complex structure.	133
5.2.2. Object of study and scale of analysis	136
5.3. Preliminary explorations of spatial variations.	139
5.3.1. Maps to explore the spatial structure of each variable	139
5.3.2. Testing the hypothesis of an administrative or spatial effect in spatial organization	143
5.4. Analyzing relationships statistically and rendering a map	149
5.4.1. Hedonic regression principles.	150
5.4.2. Model with no spatial attributes	151
5.4.3. Spatial model estimated by GWR	158
5.5. Conclusion	168
5.6. References	169

Chapter 6. Mapping Time	173
Claire CUNTY and H��l��ne MATHIAN	
6.1. Introduction.	173
6.2. Formalization.	175
6.2.1. Spatial objects and their temporal component	175
6.2.2. From spatiotemporal objects to spatiotemporal data	177
6.2.3. From geographic data to cartographic data	179
6.2.4. Visualizing time.	181
6.3. Monitoring territorial changes.	184
6.3.1. Visualizing temporal phenomena.	184
6.3.2. Representing changes	190
6.4. Representing phenomena associated with movement	191
6.4.1. Representing movements: from points to trajectories.	192
6.4.3. Shape changes	196
6.5. Representing temporality.	197
6.5.1. Tracking the spatial organization of events.	198
6.5.2. Representing lifespan, duration and change	202
6.5.3. Representing space-time.	204
6.6. Conclusion	206
6.7. References	209
Chapter 7. Cartograms, Anamorphic Maps: Transformed Territories	217
Anne-Christine BRONNER	
7.1. Introduction.	217
7.2. Cartograms to represent count data associated with areal units	219
7.2.1. Why use cartograms?.	220
7.2.2. Links between methods and data	223
7.2.3. Anatomy of the cartogram: methods.	223
7.2.4. The piezopleth map to represent rates associated with areal units.	233
7.3. Anamorphic map for the representation of space-time	234
7.3.1. Accessibility to a place (unipolar accessibility)	237
7.3.2. Accessibility between all places (multipolar accessibility).	243
7.3.3. Azimuthal transformation	246
7.4. Anamorphic maps, cartograms: cross-cutting reflections on common principles and reading difficulties	247
7.4.1. Some principles underlying all methods	247
7.4.2. Anamorphic maps layout	249
7.4.3. Reading and understanding anamorphic maps: some difficulties	250

7.5. Conclusion	251
7.6. References	252
Chapter 8. Exploration, Aggregation and Spatiotemporal Visualization of Big Data	257
Claude GRASLAND	
8.1. Introduction.	257
8.2. Defining the object of study and selecting the corpus	259
8.2.1. Press news: a multidimensional object	259
8.2.2. Defining international news	261
8.2.3. Corpus definition based on RSS news feeds	263
8.3. Crossing the “who” and “what” dimensions	264
8.4. Crossing the “who”, “what” and “when” dimensions	266
8.4.1. Detecting trends	266
8.4.2. Analysis of seasonal variations	268
8.4.3. Analysis of weekly variations.	269
8.5. Crossing the “who”, “what” and “where” dimensions.	270
8.5.1. Mapping the distribution of international news by country	271
8.5.2. Identifying and mapping specific national features	273
8.6. Graphs to represent co-location relationships.	275
8.6.1. Measuring and visualizing association links	276
8.6.2. From co-citations to global regionalization.	278
8.7. Conclusion	282
8.8. References	284
Conclusion	287
Claire CUNTY and H�el�ene MATHIAN	
List of Authors	291
Index	293