INTRASITE SPATIAL ANALYSIS
IN
THEORY AND PRACTICE

BY
H.P. BLANKHOLM

AARHUS UNIVERSITY PRESS
Contents

List of tables  9
List of map overlays and figures  13
Preface  21

1  Introduction  23
1.1 Previous research in Scandinavia and Northwest Europe  23
1.2 Aims of study  29
1.3 The individual chapters  30
1.4 How to read this book  31
1.5 Glossary and abbreviations  32

2  The development of quantitative intrasite spatial analysis in
archaeology: past and current trends  37
2.1 The early 1970s  37
2.1.1 Methods and techniques  39
2.2 Assessments and advances. The middle and late 1970s  40
2.2.1 Methods and techniques  44
2.3 Recent developments. The 1980s  45
2.3.1 Methods and techniques  47
2.4 Future directions  48

3  A set of problems  51

4  Research objectives and general methodology  53
4.1 Research objectives  53
4.2 General methodology and strategy  55
4.2.1 Application and tests of individual methods and techniques  57
4.2.2 Simulation tests  59

5  Intrisite Spatial Analysis in theory and practice  61
5.1 Individual methods and techniques  61
5.1.1 k-means Analysis  61
5.1.1.1 Operation  63
5.1.1.2 Application  64
5.1.1.3 Results and interpretation  69
5.1.1.4 Conclusions  75
5.1.2 Unconstrained Clustering  75
5.1.2.1 Operation 77
5.1.2.2 Application 82
5.1.2.3 Results and interpretation 84
5.1.2.4 Conclusions 90
5.1.3 Correspondence Analysis 91
5.1.3.1 Operation 94
5.1.3.2 Application 95
5.1.3.3 Results and interpretation 95
5.1.3.4 Conclusions 100
5.1.4 Local Density Analysis 101
5.1.4.1 Operation 102
5.1.4.2 Application 105
5.1.4.3 Results and interpretation 106
5.1.4.4 Conclusions 109
5.1.5 Nearest Neighbour Analysis 109
5.1.5.1 Operation 111
5.1.5.2 Application 114
5.1.5.3 Results and interpretation 117
5.1.5.4 Conclusions 121
5.1.6 Index of Segregation and Index of Aggregation 122
5.1.6.1 Operation 125
5.1.6.2 Application 127
5.1.6.3 Results and interpretation 128
5.1.6.4 Conclusions 130
5.1.7 Hodder and Okell's A-index of Association 130
5.1.7.1 Operation 132
5.1.7.2 Application 132
5.1.7.3 Results and interpretation 133
5.1.7.4 Conclusions 134
5.1.8 Carr's Coefficient of Polythetic Association 135
5.1.8.1 Operation 138
5.1.8.2 Application 139
5.1.9 Dimensional Analysis of Variance, Morisita's Index, Greig-Smith's Variance/Mean Ratio and Chi-square Index of Dispersion 142
5.1.9.1 Operation 146
5.1.9.2 Morisita's Index 148
5.1.9.3 Operation 149
5.1.9.4 Application 149
5.1.9.5 Results and interpretation. Conclusions 150
5.2 Presab. A new method for spatial analysis 151
5.2.1 Operation 153
5.2.2 Application 155
5.2.2.1 Application to coordinate data 155
5.2.2.1.1 Results and interpretation 157
5.2.2.1.2 Conclusions 160
5.2.2.2 Application to gridded data 160
5.2.2.2.1 Results and interpretation 162
5.2.2.2.2 Conclusions 165
5.3 Comparative evaluation 165

6 Simulation tests of selected methods 169
6.1 k-means Analysis 171
6.2 Unconstrained Clustering 172
6.3 Correspondence Analysis 173
6.4 Presab. Coordinate data 174
6.5 Presab. Gridded data 175
6.6 Conclusions 176

7 Intra- contra intersite analysis 179

8 Example of application to archaeological data. Barmose I 183
8.1 Spatial Analysis of Barmose I 187
8.1.1 k-means Analysis 192
8.1.2 Unconstrained Clustering 194
8.1.3 Correspondence Analysis 197
8.1.4 Presab. Coordinate-based analysis 199
8.1.5 Presab. Grid-based analysis 201
8.2 Conclusions 203

9 Summary and conclusions. Final remarks 207

10 Dansk resumé (Summary in Danish) 219
10.1 Tidligere forskning i Skandinavien og Nordvesteuropa 219
10.2 Arbejdets mål 220
10.3 Udviklingen af kvantitative/statistiske spredningsanalytiske metoder og teknikker 221
10.4 Problemstilling 222
10.5 Generel metode og strategi 223
10.6 Resultater 228
Table 1-73 241
Figure 1-126 297
Appendix A 371
Appendix B 375
Appendix C 391
Bibliography 395

Map overlay 1 and 2 inside back cover