

Contents

PREFACE	vii
ACKNOWLEDGMENTS	ix
CHAPTER 1: OBJECT MODELING AND GEODATABASES	1
Modeling objects with GIS.....	2
The progress of geographic data models.....	4
The geodatabase, store of geographic data.....	8
Features in an object-oriented data model	10
Serving geographic data	12
Accessing geographic data	14
Building data models.....	16
Guide to reading UML object diagrams	19
Technology trends.....	21
CHAPTER 2: HOW MAPS INFORM	23
The utility of maps.....	24
How maps present information	25
The parts of a map	27
Presenting geography with layers.....	28
Drawing features with symbols.....	30
Drawing feature layers	32
Classifying attribute values.....	36
Displaying thematic, spectral, and picture data.....	38
Visualizing surfaces with TIN layers	41
CHAPTER 3: GIS DATA REPRESENTATIONS	45
The fundamentals of a GIS.....	46
The diverse applications of GIS.....	48
Three representations of the world.....	51
Modeling surfaces.....	52
Modeling imaged or sampled data.....	54
Modeling discrete features	56
Comparing spatial data representations.....	58

CHAPTER 4: THE STRUCTURE OF GEOGRAPHIC DATA.....	61
The catalog and connections to data.....	62
The geodatabase, datasets, and feature classes	64
ArcInfo workspaces and coverages	66
Shapefiles and CAD files.....	68
Maps and layers.....	70
Comparing the structure of vector datasets	72
Comparing feature geometry in vector datasets.....	73
CHAPTER 5: SMART FEATURES.....	75
The qualities of features.....	76
Steps to making features smart	78
Designing the geodatabase.....	80
Storing data in tables.....	82
The shape and extent of features	84
Attributes: qualities of an object.....	86
Adding simple behavior with subtypes	88
Validating attributes	90
Relationships among objects	92
Extending object classes.....	96
The geodatabase object model.....	98
CHAPTER 6: THE SHAPE OF FEATURES	101
Geometry and features.....	102
Constructing geometry.....	105
Testing spatial relationships.....	110
Applying topological operators.....	112
Geometry object model	114
CHAPTER 7: MANAGING WORK FLOW WITH VERSIONS.....	115
Using versions.....	116
Long transactions and the geodatabase	118
The fundamentals of versions	120
Editing versioned geodatabases	122
Types of work flows	124

CHAPTER 8: LINEAR MODELING WITH NETWORKS	127
Modeling infrastructure.....	128
The network model.....	130
How features connect.....	132
Network features.....	134
Network flow	139
Analysis on a network.....	142
Network object model.....	145
CHAPTER 9: CELL-BASED MODELING WITH RASTERS	147
Representing geography with rasters.....	148
Using raster data.....	150
Raster data model.....	152
Raster display and analysis	154
The spatial context of rasters.....	156
Raster formats.....	158
Raster object model	160
CHAPTER 10: SURFACE MODELING WITH TINS	161
Representing surfaces	162
Structure of a TIN.....	164
Modeling surface features	166
CHAPTER 11: FINDING LOCATIONS	169
Using locations	170
Converting locations to map features.....	172
Converting x,y locations.....	173
Converting addresses.....	174
Converting place names	177
Converting postal zones.....	178
Converting route locations	179

CHAPTER 12: GEODATABASE DESIGN GUIDE.....	181
Purpose and goals of design	182
Overview of design steps	184
Step 1: Model the user’s view	186
Step 2: Define entities and relationships.....	188
Step 3: Identify representation of entities.....	190
Step 4: Match to geodatabase data model	192
Step 5: Organize into geographic data sets	194
INDEX.....	197