Contents

Foreword ix

Acknowledgments xi

Chapter 1 Introduction 1

The fundamental regional land-use equation
The LUCIS mission

Part I Foundations

Chapter 2 What is LUCIS? 9

The origin of LUCIS
The five steps of LUCIS
Role-playing
Definitions

Chapter 3 Basic GIS concepts 15

A brief history of GIS

Vector versus raster data

The ArcGIS geoprocessing framework

Basic vector analysis tools

Basic raster analysis tools

Chapter 4 Logical arguments for suitability 45

A brief history of suitability modeling
Rules for combining spatial data
Single utility assignments for suitability modeling
Ranking strategies for single utility assignments
Multiple utility assignments for suitability modeling

		Part II The LUCIS model
	Chapter 5	The case study 73
		Regional character
		Context
		Population growth
		Household size and urban densities
	Chapter 6	Defining goals and objectives 81
		Statement of intent
		Goals and objectives
		Goals and objectives for the Florida case study
		A naming convention for managing models, input data, and results
	Chapter 7	Data inventory and preparation 89
		Identifying potential data
		Data accuracy
		Data resources
		Map projections
		Cell size and the minimum mapping unit
		Derived datasets and documentation
		Dataset preparation for the Florida case study
	Chapter 8	Defining and mapping land-use suitability 101 General suitability concepts
		Defining and mapping land-use suitability for the Florida case study
	Chapter 9	Integrating community values to determine land-use preference 127
		Suitability becomes preference
	Chapter 10	Identifying potential land-use conflict 137
		Remove lands whose use will not change
		Normalize and collapse preference results
		Conceptualized conflict
		Conflict mapping
		The case study models
		Using the LUCIS results

Part III Seeing the future

Chapter 11 Future land-use allocation 165

The fundamental regional land-use equation revisited

Six steps for visualizing future land use

Chapter 12 Conclusion 189

The structural framework of LUCIS

The three most significant steps of LUCIS

Using LUCIS to visualize future land use

Where do we go from here?

Chapter assignments 203

Appendix 1 Goals and objectives example 219

Appendix 2 LUCIS case study goals and objectives 229

Appendix 3 Agriculture data inventory 239

Glossary 243

About the DVD 251

Data license agreement 267

About the authors 271

Index 273