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# An Introduction To Using Gis In Marine Biology Supplementary Workbook Six An Introduction To Creating Custom Gis Tools

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Open Source Geographic Information System  
Introduction to GIS Programming and Fundamentals with Python and ArcGIS®  
Supplementary Workbook Seven: An Introduction to Using Qgis (Quantum GIS)  
Geographic Information Systems (GIS) for Disaster Management  
Introduction to QGIS  
A First Text on Geographic Information Systems  
An Applied Guide for Geo-spatial Analysis  
An Introduction to Using GIS in Marine Biology  
Supplementary Workbook Two: Working with Raster Data Layers  
An Introduction for GIS Users  
Fundamental Geographic and Cartographic Concepts  
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Key Concepts and Techniques in GIS  
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Supplementary Workbook One: Creating Maps Of Species Distribution  
An Introduction to Spatial Data Analysis  
An Introduction To Using GIS In Marine Biology  
Learning GIS Using Open Source Software  
10 Big Ideas about Applying the Science of where

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## JAELYN ERICK

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**Open Source Geographic Information System** Oxford  
University Press

This book is the third companion volume to 'An Introduction To Using GIS In Marine Biology'. It is designed to augment the information on using GIS in marine biology provided in that book, and, indeed, to be used alongside it rather than to be used independently as a stand-alone volume. Therefore, this book will be of most interest to those who have already read 'An Introduction To Using GIS In Marine Biology'. This book consists of five exercises covering the practical use of GIS in marine biology using ERSI's ArcGIS(r) 10.2 GIS software and R statistical software. These exercises are based around integrating GIS and Species Distribution Modelling (SDM), and work through an example of an SDM from processing your survey data, through making raster data layers of environmental variables to constructing an SDM, visualising its predicted spatial distribution and validating its predictive ability. The exercises are designed to be followed in the order they are presented, and work with a specific data set, which can be downloaded separately for free. Working through these five exercises will help the novice GIS user obtain experience in creating and using SDMs, and so develop their GIS skills. Unlike most other GIS tutorials, this information is specifically presented in a marine biological context and all the exercises use real data from a marine biological study. Therefore, these exercises are more likely to provide the kind of experience in using GIS that marine biologists will find useful and applicable to their own research. These exercises are presented in the same easy-to-follow flow diagram-based format first introduced in the 'How To...' section of 'An Introduction To Using GIS In Marine Biology'. They are accompanied by images which show the user

how their GIS project should look as they progress through the exercises, allowing them to compare their own work to the expected results. This is part of the PSLS series of books which use Task-Oriented Learning (TOL) to teach the practical application of research skills to the life sciences. This involves demonstrating how these skills can be used in the specific circumstances in which they are likely to be required rather than concentrating on teaching theoretical frameworks or on teaching skills in a generic or abstract manner. By seeing how the similar processes are used to achieve a variety of different goals within a specific field, it becomes easier for the reader to identify the general rules behind the practical application of these processes and, therefore, to transfer them to novel situations they may encounter in the future

*Introduction to GIS Programming and Fundamentals with Python and ArcGIS®* CRC Press

We are in an age of big data where all of our everyday interactions and transactions generate data. Much of this data is spatial – it is collected some-where – and identifying analytical insight from trends and patterns in these increasing rich digital footprints presents a number of challenges. Whilst other books describe different flavours of Data Analytics in R and other programming languages, there are none that consider Spatial Data (ie the location attached to data), or that consider issues of inference, linking Big Data, Geography, GIS, Mapping and Spatial Analytics. This is a 'learning by doing' text book, building on the previous book by the same authors, *An Introduction to R for Spatial Analysis and Mapping*. It details the theoretical issues in analyses of Big Spatial Data and developing practical skills in the reader for addressing these with confidence.

**Supplementary Workbook Seven: An Introduction to Using Qgis (Quantum GIS)** CRC Press

Geocomputation with R is for people who want to analyze, visualize and model geographic data with open source software. It is based on R, a statistical programming language that has

powerful data processing, visualization, and geospatial capabilities. The book equips you with the knowledge and skills to tackle a wide range of issues manifested in geographic data, including those with scientific, societal, and environmental implications. This book will interest people from many backgrounds, especially Geographic Information Systems (GIS) users interested in applying their domain-specific knowledge in a powerful open source language for data science, and R users interested in extending their skills to handle spatial data. The book is divided into three parts: (I) Foundations, aimed at getting you up-to-speed with geographic data in R, (II) extensions, which covers advanced techniques, and (III) applications to real-world problems. The chapters cover progressively more advanced topics, with early chapters providing strong foundations on which the later chapters build. Part I describes the nature of spatial datasets in R and methods for manipulating them. It also covers geographic data import/export and transforming coordinate reference systems. Part II represents methods that build on these foundations. It covers advanced map making (including web mapping), "bridges" to GIS, sharing reproducible code, and how to do cross-validation in the presence of spatial autocorrelation. Part III applies the knowledge gained to tackle real-world problems, including representing and modeling transport systems, finding optimal locations for stores or services, and ecological modeling. Exercises at the end of each chapter give you the skills needed to tackle a range of geospatial problems. Solutions for each chapter and supplementary materials providing extended examples are available at <https://geocompr.github.io/geocompr/articles/>. Dr. Robin Lovelace is a University Academic Fellow at the University of Leeds, where he has taught R for geographic research over many years, with a focus on transport systems. Dr. Jakub Nowosad is an Assistant Professor in the Department of Geoinformation at the Adam Mickiewicz University in Poznan, where his focus is on the analysis of large datasets to understand environmental processes. Dr. Jannes Muenchow is a Postdoctoral

Researcher in the GIScience Department at the University of Jena, where he develops and teaches a range of geographic methods, with a focus on ecological modeling, statistical geocomputing, and predictive mapping. All three are active developers and work on a number of R packages, including stplanr, sabre, and RQGIS.

### **Geographic Information Systems (GIS) for Disaster**

**Management** Taylor & Francis

This is a hands-on book about ArcGIS that you work with as much as read. By the end, using Learn ArcGIS lessons, you'll be able to say you made a story map, conducted geographic analysis, edited geographic data, worked in a 3D web scene, built a 3D model of Venice, and more.

*Introduction to QGIS* John Wiley & Sons

GIS and the Social Sciences offers a uniquely social science approach on the theory and application of GIS with a range of modern examples. It explores how human geography can engage with a variety of important policy issues through linking together GIS and spatial analysis, and demonstrates the importance of applied GIS and spatial analysis for solving real-world problems in both the public and private sector. The book introduces basic theoretical material from a social science perspective and discusses how data are handled in GIS, what the standard commands within GIS packages are, and what they can offer in terms of spatial analysis. It covers the range of applications for which GIS has been primarily used in the social sciences, offering a global perspective of examples at a range of spatial scales. The book explores the use of GIS in crime, health, education, retail location, urban planning, transport, geodemographics, emergency planning and poverty/income inequalities. It is supplemented with practical activities and datasets that are linked to the content of each chapter and provided on an eResource page. The examples are written using ArcMap to show how the user can access data and put the theory in the textbook to applied use using proprietary GIS software. This book serves as a useful guide to a social science approach to GIS techniques and applications. It provides a range of modern applications of GIS with associated practicals to work through, and demonstrates how researcher and policy makers alike can use GIS to plan services more effectively. It will prove to be of great interest to geographers, as well as the broader social sciences, such as sociology, crime science, health, business and marketing.

### **A First Text on Geographic Information Systems** Pelagic Publishing Ltd

This book is the fifth companion volume to 'An Introduction To Using GIS In Marine Biology'. It is designed to augment the information on using GIS in marine biology provided in that book, and, indeed, to be used alongside it rather than to be used independently as a stand-alone volume. Therefore, this book will be of most interest to those who have already read 'An Introduction To Using GIS In Marine Biology'. This book consists of five exercises covering the practical use of GIS in marine biology using ESRI's ArcGIS(r) 10.2 software. These exercises are based around creating maps for reports and presentations. They range from making a map template which allows you to quickly make new maps in a standard format to creating a custom legend which allows you to repeatedly apply the same symbols to multiple data layers and making multi-part maps. The exercises are designed to be followed in the order they are presented, and work with a specific data set, which can be download separately for free. Working through these five exercises will help the novice GIS user obtain experience making maps for reports and presentations, and so develop their GIS skills. Unlike most other GIS tutorials, this information is specifically presented in a marine biological context and all the exercises use real data from a marine biological study. Therefore, these exercises are more likely to provide the kind of experience in using GIS that marine biologists will find useful and applicable to their own research. These exercises are presented in the same easy-to-follow flow diagram-based format first introduced in the 'How To...' section of 'An Introduction To Using GIS In Marine Biology'. They are accompanied by images which show the user how their GIS project should look as they progress through the exercises, allowing them to compare their own work to the expected results. This is part of the PSLS series of books which use Task-Oriented Learning (TOL) to teach the practical application of research skills to the life sciences. This involves demonstrating how these skills can be used in the specific circumstances in which they are likely to be required rather than concentrating on teaching theoretical frameworks or on teaching skills in a generic or abstract manner. By seeing how the similar processes are used to achieve a variety of different goals within a specific field, it becomes easier for the reader to identify the general rules behind the practical application of these processes

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*An Applied Guide for Geo-spatial Analysis* Routledge

This textbook examines the choices considered when creating geographic representations and cartographic representations, transforming spherical coordinates to planar coordinates, and modeling geographic data. Harvey (geography, University of Minnesota) introduces the three generic options for recording the locations and characteristics of things and events, the principles of remote sensing, map design elements, and geostatistical methods. Fifteen color plates are provided in the middle of the book, while black and white images are scattered throughout.

### **An Introduction to Using GIS in Marine Biology** Anchor Books

This book is the second companion volume to 'An Introduction To Using GIS In Marine Biology'. It is designed to augment the information on using GIS in marine biology provided in that book, and, indeed, to be used alongside it rather than to be used independently as a stand-alone volume. Therefore, this book will be of most interest to those who have already read 'An Introduction To Using GIS In Marine Biology'. This book consists of five exercises covering the practical use of GIS in marine biology using ESRI's ArcGIS(r) 10.2 software. These exercises are based around creating and using raster data layers to display and analyse environmental variables. They range from making raster data layers of environmental variables to linking this information to data layers of species occurrence. Working through these five exercises will help the novice GIS user obtain experience in working with raster data layers of environmental variables and so develop their GIS skills. Unlike most other GIS tutorials, this information is specifically presented in a marine biological context and all the exercises use real data from a marine biological study. Therefore, these exercises are more likely to provide the kind of experience in using GIS that marine biologists will find useful and applicable to their own research. These exercises are presented in the same easy-to-follow flow diagram-based format first introduced in the 'How To...' section of 'An Introduction To Using GIS In Marine Biology'. They are accompanied by images which show the user how their GIS project should look as they progress through the exercises, allowing them to compare their own work to the expected results. This is part of the PSLS series of books

which use Task-Oriented Learning (TOL) to teach the practical application of research skills to the life sciences. This involves demonstrating how these skills can be used in the specific circumstances in which they are likely to be required rather than concentrating on teaching theoretical frameworks or on teaching skills in a generic or abstract manner. By seeing how the similar processes are used to achieve a variety of different goals within a specific field, it becomes easier for the reader to identify the general rules behind the practical application of these processes and, therefore, to transfer them to novel situations they may encounter in the future

**Supplementary Workbook Two: Working with Raster Data Layers** Locate Press

Now in its second edition, Geographic Information Systems (GIS) for Disaster Management has been completely updated to take account of new developments in the field. Using a hands-on approach grounded in relevant GIS and disaster management theory and practice, this textbook continues the tradition of the benchmark first edition, providing coverage of GIS fundamentals applied to disaster management. Real-life case studies demonstrate GIS concepts and their applicability to the full disaster management cycle. The learning-by-example approach helps readers see how GIS for disaster management operates at local, state, national, and international scales through government, the private sector, non-governmental organizations, and volunteer groups. New in the second edition: a chapter on allied technologies that includes remote sensing, Global Positioning Systems (GPS), indoor navigation, and Unmanned Aerial Systems (UAS); thirteen new technical exercises that supplement theoretical and practical chapter discussions and fully reinforce concepts learned; enhanced boxed text and other pedagogical features to give readers even more practical advice; examination of new forms of world-wide disaster faced by society; discussion of new commercial and open-source GIS technology and techniques such as machine learning and the Internet of Things; new interviews with subject-matter and industry experts on GIS for disaster management in the US and abroad; new career advice on getting a first job in the industry. Learned yet accessible, Geographic Information Systems (GIS) for Disaster Management continues to be a valuable teaching tool for undergraduate and graduate instructors in the disaster

management and GIS fields, as well as disaster management and humanitarian professionals. Please visit <http://gisfordisastermanagement.com> to view supplemental material such as slides and hands-on exercise video walkthroughs. This companion website offers valuable hands-on experience applying concepts to practice.

*An Introduction for GIS Users* Prentice Hall

This book is the sixth companion volume to 'An Introduction To Using GIS In Marine Biology'. It is designed to augment the information on using GIS in marine biology provided in that book, and, indeed, to be used alongside it rather than to be used independently as a stand-alone volume. Therefore, this book will be of most interest to those who have already read 'An Introduction To Using GIS In Marine Biology'. This book consists of five exercises covering the practical use of GIS in marine biology using ESRI's ArcGIS(r) 10.2 GIS software. These exercises are based around the creation of custom GIS tools to automate tasks which need to be done on a regular basis. These start with the creation of relatively simple tool to plot species locational data before progressing on to the creation of more complex custom tools and creating the appropriate metadata to accompany custom GIS tools. The exercises are designed to be followed in the order they are presented, and work with a specific data set which can be downloaded for free. Working through these five exercises will help the novice GIS user obtain experience in creating custom GIS tools, and so develop their GIS skills. Unlike most other GIS tutorials, this information is specifically presented in a marine biological context and all the exercises use real data from a marine biological study. Therefore, these exercises are more likely to provide the kind of experience in using GIS that marine biologists will find useful and applicable to their own research. These exercises are presented in the same easy-to-follow flow diagram-based format first introduced in the 'How To...' section of 'An Introduction To Using GIS In Marine Biology'. They are accompanied by images which show the user how their GIS project should look as they progress through the exercises, allowing them to compare their own work to the expected results. This is part of the PLS series of books which use Task-Oriented Learning (TOL) to teach the practical application of research skills to the life sciences. This involves demonstrating how these skills can be used in the specific circumstances in which they are likely

to be required rather than concentrating on teaching theoretical frameworks or on teaching skills in a generic or abstract manner. By seeing how the similar processes are used to achieve a variety of different goals within a specific field, it becomes easier for the reader to identify the general rules behind the practical application of these processes and, therefore, to transfer them to novel situations they may encounter in the future.

**Fundamental Geographic and Cartographic Concepts** CRC Press

GIS and Geostatistical Techniques for Groundwater Science provides a detailed synthesis of the application of GIS and geostatistics in groundwater studies. As the book illustrates, GIS can be a powerful tool for developing solutions for water resource problems, assessing water quality, and managing water resources. Beginning with an introduction to the history of GIS and geostatistical techniques in groundwater studies, the book then describes various spatial techniques, including case studies for various applications, from quality assessment, to resource management. This book assembles the most up-to-date techniques in GIS and geostatistics as they relate to groundwater, one of our most important natural resources. Provides details on the application of GIS and statistics in groundwater studies Includes practical coverage of the use of spatial analysis techniques in groundwater science Bridges the gap between geostatistics and GIS as it relates to groundwater science and management Offers worldwide case studies to illustrate various techniques and applications in addressing groundwater issues [Supplementary Workbook Four: Investigating Home Ranges of Individual Animals](#) Routledge

Authoritative and comprehensive, this is the leading text and professional resource on using geographic information systems (GIS) to analyze and address public health problems. Basic GIS concepts and tools are explained, including ways to access and manage spatial databases. The book presents state-of-the-art methods for mapping and analyzing data on population, health events, risk factors, and health services, and for incorporating geographical knowledge into planning and policy. Numerous maps, diagrams, and real-world applications are featured. The companion Web page provides lab exercises with data that can be downloaded for individual or course use. New to This Edition \*Incorporates major technological advances, such as Internet-

based mapping systems and the rise of data from cell phones and other GPS-enabled devices. \*Chapter on health disparities.

\*Expanded coverage of public participation GIS. \*Companion Web page has all-new content. \*Goes beyond the United States to encompass an international focus.

#### Key Concepts and Techniques in GIS Anchor Books

GISAn Introduction to Mapping TechnologiesCRC Press

*Spatial Data Analysis* Pelagic Publishing Ltd

An integrated approach that combines essential GIS background with a practical workbook on applying the principles in ArcGIS 10.0 and 10.1 *Introducing Geographic Information Systems with ArcGIS* integrates a broad introduction to GIS with a software-specific workbook for Esri's ArcGIS. Where most courses make do using two separate texts, one covering GIS and another the software, this book enables students and instructors to use a single text with an integrated approach covering both in one volume with a common vocabulary and instructional style. This revised edition focuses on the latest software updates—ArcGIS 10.0 and 10.1. In addition to its already successful coverage, the book allows students to experience publishing maps on the Internet through new exercises, and introduces the idea of programming in the language Esri has chosen for applications (i.e., Python). A DVD is packaged with the book, as in prior editions, containing data for working out all of the exercises. This complete, user-friendly coursebook: Is updated for the latest ArcGIS releases—ArcGIS 10.0 and 10.1 *Introduces the central concepts of GIS and topics needed to understand spatial information analysis* Provides a considerable ability to operate important tools in ArcGIS *Demonstrates new capabilities of ArcGIS 10.0 and 10.1* Provides a basis for the advanced study of GIS and the study of the newly emerging field of GIScience *Introducing Geographic Information Systems with ArcGIS, Third Edition* is the ideal guide for undergraduate students taking courses such as *Introduction to GIS, Fundamentals of GIS, and Introduction to ArcGIS Desktop*. It is also an important guide for professionals looking to update their skills for ArcGIS 10.0 and 10.1.

#### **Supplementary Workbook Six: An Introduction To Creating Custom GIS Tools** Routledge

This is a new edition of the accessible and student-friendly 'how to' for anyone using R for the first time, for use in spatial statistical analysis, geocomputation and digital mapping. The

authors, once again, take readers from 'zero to hero', updating the now standard text to further enable practical R applications in GIS, spatial analyses, spatial statistics, web-scraping and more. Revised and updated, each chapter includes: example data and commands to explore hands-on; scripts and coding to exemplify specific functionality; self-contained exercises for students to work through; embedded code within the descriptive text. The new edition includes detailed discussion of new and emerging packages within R like sf, ggplot, tmap, making it the go to introduction for all researchers collecting and using data with location attached. This is the introduction to the use of R for spatial statistical analysis, geocomputation, and GIS for all researchers - regardless of discipline - collecting and using data with location attached.

#### Theory and Applications CRC Press

To understand the output from a geographic information system, one must understand the quality of the data that is entered into the system, the algorithms driving the data processing, and the limitations of the graphic displays. *Introduction to Mathematical Techniques Used in GIS* explains to nonmathematicians the fundamentals that support the manipulation and display of geographic information. It focuses on basic mathematical techniques, building upon a series of steps that enable a deeper understanding of the complex forms of manipulation that arise in the handling of spatially related data. The book moves rapidly through a wide range of data transformations, outlining the techniques involved. Many are precise, building logically on underlying assumptions. Others are based upon statistical analysis and the pursuit of the optimum rather than the perfect and definite solution. By understanding the mathematics behind the gathering, processing, and display of information, GIS professionals can advise others on the integrity of results, the quality of the information, and the safety of using it.

#### **An Introduction to R for Spatial Analysis and Mapping**

Anchor Books

This book is the fourth companion volume to 'An Introduction To Using GIS In Marine Biology'. It is designed to augment the information on using GIS in marine biology provided in that book, and, indeed, to be used alongside it rather than to be used independently as a stand-alone volume. Therefore, this book will be of most interest to those who have already read 'An

*Introduction To Using GIS In Marine Biology*'. This book consists of five exercises covering the practical use of GIS in marine biology using ERSI's ArcGIS(r) 10.2 GIS software. These exercises are based around using GIS to investigate the home ranges of individual animals. They range from creating minimum convex polygons (MCPs) and kernel density estimates (KDEs) to comparing the home ranges of different individuals in a population. The exercises are designed to be followed in the order they are presented, and work with a specific data set which can be downloaded for free. Working through these five exercises will help the novice GIS user obtain experience in investigating the home ranges of individual animals in a GIS-based environment, and so develop their GIS skills. Unlike most other GIS tutorials, this information is specifically presented in a marine biological context and all the exercises use real data from a marine biological study. Therefore, these exercises are more likely to provide the kind of experience in using GIS that marine biologists will find useful and applicable to their own research. These exercises are presented in the same easy-to-follow flow diagram-based format first introduced in the 'How To...' section of 'An Introduction To Using GIS In Marine Biology'. They are accompanied by images which show the user how their GIS project should look as they progress through the exercises, allowing them to compare their own work to the expected results. This is part of the PSLS series of books which use Task-Oriented Learning (TOL) to teach the practical application of research skills to the life sciences. This involves demonstrating how these skills can be used in the specific circumstances in which they are likely to be required rather than concentrating on teaching theoretical frameworks or on teaching skills in a generic or abstract manner. By seeing how the similar processes are used to achieve a variety of different goals within a specific field, it becomes easier for the reader to identify the general rules behind the practical application of these processes and, therefore, to transfer them to novel situations they may encounter in the futur

GIS: A Short Introduction GISAn Introduction to Mapping Technologies  
This is a book about how ecologists can integrate remote sensing and GIS in their daily work. It will allow ecologists to get started with the application of remote sensing and to understand its potential and limitations. Using practical examples, the book

covers all necessary steps from planning field campaigns to deriving ecologically relevant information through remote sensing and modelling of species distributions. All practical examples in this book rely on OpenSource software and freely available data sets. Quantum GIS (QGIS) is introduced for basic GIS data handling, and in-depth spatial analytics and statistics are conducted with the software packages R and GRASS. Readers will learn how to apply remote sensing within ecological research projects, how to approach spatial data sampling and how to interpret remote sensing derived products. The authors discuss a wide range of statistical analyses with regard to satellite data as well as specialised topics such as time-series analysis. Extended scripts on how to create professional looking maps and graphics are also provided. This book is a valuable resource for students and scientists in the fields of conservation and ecology interested in learning how to get started in applying remote sensing in ecological research and conservation planning.

Technologies, Methodologies, and Scholarship CRC Press

This is the first supplementary workbook produced to accompany 'An Introduction To Using GIS In Marine Biology' by the same author. It is designed to augment the information on using GIS in marine biology provided in that book, and indeed, to be used alongside it rather than to be used independently as a stand-alone volume. This second edition has been updated for ArcGIS

10.1 software and it contains five exercises covering the practical use of GIS in marine biology. These exercises are based around mapping species distribution and range from making a simple map of the locations where a species has been recorded to creating grids of species presence-absence, species richness and abundance. Working through these five exercises will help the novice GIS user obtain experience in working with GIS and so develop their GIS skills. Unlike most other GIS tutorials, this information is specifically presented in a marine biological context and all the exercises use real data from a marine biological study. Therefore, these exercises are more likely to provide the kind of experience in using GIS that marine biologists will find useful and applicable to their own research. These exercises are presented in the same easy-to-follow flow diagram-based format first introduced in the 'How To...' section of 'An Introduction To Using GIS In Marine Biology'. They are accompanied by images which show the user how their GIS project should look as they progress through the exercises, allowing them to compare their own work to the expected results. This is part of the PSLs series of books which use Task-Oriented Learning (TOL) to teach the practical application of research skills to the life sciences. This involves demonstrating how these skills can be used in the specific circumstances in which they are likely to be required rather than concentrating on teaching theoretical frameworks or on teaching

skills in a generic or abstract manner. By seeing how the similar processes are used to achieve a variety of different goals within a specific field, it becomes easier for the reader to identify the general rules behind the practical application of these processes and, therefore, to transfer them to novel situations they may encounter in the future.

**GIS Fundamentals** Routledge

Key Concepts and Techniques in GIS is a concise overview of the fundamental ideas that inform geographic information science. It provides detailed descriptions of the concepts and techniques that anyone using GIS software must fully understand to analyse spatial data. Short and clearly focussed chapters provide explanations of: spatial relationships and spatial data the creation of digital data, the use and access of existing data, the combination of data the use of modelling techniques and the essential functions of map algebra spatial statistics and spatial analysis geocomputation - including discussion of neural networks, cellular automata, and agent-based modelling Illustrated throughout with explanatory figures, the text also includes a glossary, cross referenced to discussion in the text. Written very much from a user's perspective, Key Concepts and Techniques in GIS is highly readable refresher course for intermediate level students and practitioners of GIS in the social and the natural sciences.