

crime analysis and crime mapping

Unlocking the Secrets of Crime: A Deep Dive into Crime Analysis and Crime Mapping

Introduction:

Are you fascinated by the intricate patterns hidden within crime statistics? Do you wonder how law enforcement agencies predict and prevent criminal activity? This comprehensive guide delves into the powerful worlds of crime analysis and crime mapping, revealing how these techniques are revolutionizing crime prevention and investigation. We'll explore the methodologies, technologies, and crucial applications of these fields, demonstrating their profound impact on community safety and public policy. From understanding basic statistical analysis to visualizing crime hotspots using sophisticated mapping software, this post offers a complete understanding of crime analysis and crime mapping, empowering you to decipher the complex landscape of criminal activity.

What is Crime Analysis?

Crime analysis is the systematic process of identifying, collecting, and analyzing crime-related data to understand patterns, trends, and relationships. It's far more than simply counting crimes; it involves applying statistical methods and analytical techniques to uncover hidden connections and inform strategic decision-making. This involves:

Data Collection: Gathering information from various sources like police reports, crime databases, and even social media.

Data Cleaning & Organization: Ensuring data accuracy, consistency, and proper formatting for analysis.

Statistical Analysis: Utilizing techniques like regression analysis, time series analysis, and spatial autocorrelation to identify trends and patterns.

Interpreting Results: Understanding the implications of the analysis and translating findings into actionable intelligence.

Reporting & Dissemination: Communicating findings effectively to stakeholders, including law enforcement, policymakers, and the community.

Types of Crime Analysis:

Several approaches fall under the umbrella of crime analysis. These include:

Strategic Crime Analysis: Focuses on long-term crime trends and patterns, informing the development of proactive crime prevention strategies.

Tactical Crime Analysis: Concentrates on immediate crime problems, providing real-time intelligence for responding to ongoing criminal activity.

Administrative Crime Analysis: Primarily used for resource allocation and

management within law enforcement agencies.

Intelligence-Led Policing (ILP): A broader approach that utilizes crime analysis as a core component to guide policing strategies based on evidence and intelligence.

What is Crime Mapping?

Crime mapping is the visual representation of crime data on a geographical map. It's a powerful tool that transforms raw data into readily understandable visualisations, revealing spatial clusters, hotspots, and patterns that might otherwise be missed. Effective crime mapping utilizes Geographic Information Systems (GIS) software, allowing analysts to:

Visualize Crime Incidents: Plot crime locations precisely on a map, providing a clear picture of crime distribution.

Identify Crime Hotspots: Pinpoint areas with a high concentration of crime, facilitating targeted interventions.

Analyze Spatial Relationships: Investigate the relationship between crime and other factors like socioeconomic indicators, environmental features, or infrastructure.

Track Crime Trends Over Time: Monitor changes in crime patterns over specific periods, assessing the effectiveness of interventions.

Communicate Findings Effectively: Present crime data in a visually compelling manner to various stakeholders.

Software and Technologies Used in Crime Analysis and Mapping:

Modern crime analysis and mapping rely heavily on sophisticated software and technologies. Popular options include:

ArcGIS: A leading GIS software widely used in law enforcement for spatial analysis and mapping.

QGIS: A free and open-source GIS alternative with powerful capabilities.

CrimeStat: Specialized software for spatial crime analysis, offering a range of statistical tools.

CompStat (Comparative Statistics): A management strategy that utilizes crime mapping and analysis to hold police commanders accountable for crime reduction in their precincts.

The Synergistic Relationship Between Crime Analysis and Crime Mapping:

Crime analysis and crime mapping are intrinsically linked; they complement each other to provide a holistic understanding of crime. Crime analysis provides the insights derived from data, while crime mapping visualizes these insights, making them easily understandable and actionable. Together, they form a powerful crime-fighting tool.

Applications of Crime Analysis and Crime Mapping:

These techniques have far-reaching applications, including:

Resource Allocation: Identifying areas requiring increased police presence or other resources.

Patrol Optimization: Developing efficient patrol routes based on crime hotspots and patterns.

Crime Prevention Strategies: Implementing targeted interventions based on identified crime trends.

Investigative Support: Providing valuable insights to assist in criminal investigations.

Community Engagement: Informing the public about crime trends and fostering community partnerships.

Predictive Policing: Utilizing advanced analytical techniques to predict future crime occurrences.

Challenges and Limitations:

Despite their considerable value, crime analysis and crime mapping face certain challenges:

Data Quality: Inaccurate or incomplete data can compromise the reliability of analysis and mapping.

Data Privacy: Protecting the privacy of individuals involved in crime incidents is crucial.

Interpretation Bias: Analyst biases can influence the interpretation of findings.

Technological Limitations: Software limitations or lack of access to advanced technologies can hinder analysis capabilities.

Limited Predictive Power: Predictive policing is not foolproof and should be used ethically and responsibly.

The Future of Crime Analysis and Crime Mapping:

The field is constantly evolving, with advancements in technology and analytical techniques driving innovation. We can expect to see:

Increased use of Big Data and AI: Utilizing vast datasets and artificial intelligence for more accurate predictions and insights.

Integration with other data sources: Combining crime data with social media, sensor data, and other sources for a more comprehensive picture.

Enhanced visualization techniques: Developing more sophisticated and interactive mapping tools.

Greater emphasis on ethical considerations: Focusing on responsible use of predictive policing and data privacy.

Book Outline: "Deciphering Crime: A Guide to Crime Analysis and Crime Mapping"

Introduction: Defining crime analysis and mapping, highlighting their importance.

Chapter 1: Fundamentals of Crime Analysis: Data sources, cleaning, and basic statistical methods.

Chapter 2: Advanced Crime Analysis Techniques: Regression analysis, time series analysis, spatial autocorrelation.

Chapter 3: Introduction to Geographic Information Systems (GIS): Software options, data visualization, and map creation.

Chapter 4: Crime Mapping Techniques and Applications: Hotspot analysis, spatial clustering, and trend analysis.

Chapter 5: Integrating Crime Analysis and Crime Mapping: Combining insights for effective crime prevention.

Chapter 6: Case Studies: Real-world examples of successful crime analysis and mapping projects.

Chapter 7: Challenges and Ethical Considerations: Addressing limitations and ensuring responsible application.

Conclusion: Summary of key findings and future directions for the field.

(Note: The following sections would expand on each chapter of the proposed book. Due to length constraints, I will provide brief summaries instead of full chapter expansions.)

(Chapter Summaries – would be significantly expanded in the actual book.)

Chapter 1: Covers the basics of data collection from various sources (police reports, incident databases, etc.), data cleaning procedures, and elementary statistical concepts like averages, percentages, and rates relevant to crime data.

Chapter 2: Expands on advanced statistical techniques used in crime analysis, explaining concepts like regression analysis (to understand relationships between variables), time series analysis (to identify trends over time), and spatial autocorrelation (to identify clustering patterns).

Chapter 3: Introduces the fundamental concepts of GIS and its application in crime mapping. It describes the functionality of different GIS software packages, data input methods, and map creation.

Chapter 4: Delves into different crime mapping techniques, explaining hotspot analysis (identifying high-crime areas), spatial clustering techniques (analyzing spatial relationships between crimes), and methods for visualizing crime trends over time.

Chapter 5: Demonstrates how crime analysis and crime mapping are used synergistically, emphasizing the importance of combining quantitative insights from analysis with the visual representations provided by maps.

Chapter 6: Presents case studies from various law enforcement agencies or research projects, showcasing successful applications of crime analysis and crime mapping in crime prevention and investigation.

Chapter 7: Discusses potential limitations and ethical concerns associated

with crime analysis and mapping, including issues of data privacy, potential for bias in analysis, and the responsible use of predictive policing.

FAQs:

1. What is the difference between crime analysis and crime mapping? Crime analysis is the statistical process of interpreting crime data, while crime mapping visually represents that data on a map.
1. What software is commonly used for crime mapping? ArcGIS, QGIS, and CrimeStat are popular choices.
1. Can crime mapping predict future crimes? While not perfectly predictive, sophisticated techniques can identify high-risk areas for future crime.
1. What are the ethical concerns surrounding crime mapping and analysis? Data privacy and potential biases in interpretation are key ethical concerns.
1. How can crime mapping help allocate resources effectively? By identifying crime hotspots, agencies can deploy resources where they are most needed.
1. What type of data is used in crime analysis? Police reports, census data, social media data, and other relevant sources.
1. What are the limitations of crime analysis? Data quality, biases, and technological limitations can affect the accuracy and reliability of analysis.
1. Is predictive policing effective? Its effectiveness is debated, but it

can identify potential high-risk areas for crime.

1. How can communities benefit from crime mapping? They can be better informed about local crime trends and participate in crime prevention initiatives.

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4. Data-Driven Policing: Optimizing Patrol Strategies: Focuses on using data analysis to improve police deployment.
5. The Role of Crime Analysis in Community Policing: Highlights the community aspect of crime analysis and its preventative strategies.
6. Ethical Considerations in Crime Analysis and Prediction: Addresses ethical concerns surrounding data privacy and predictive policing.
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crime analysis and crime mapping: Crime Analysis and Crime Mapping Rachel Boba, Rachel Boba Santos, 2005-07-08 Crime analysis is an emerging profession in policing and a growing topic of interest in the criminal justice field. This book offers a thorough introduction to the field as well as guidelines for its practice, making it a useful asset for current and future crime analysts and police practitioners as well as for students.

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crime analysis and crime mapping: Introduction to Crime Analysis Deborah Osborne, Susan Wernicke, 2003 This book is a practical resource guide for the development of crime analysis in local law enforcement. The tragedy of September 11, 2001, has raised awareness on how crucial it is to analyze information and intelligence. Smaller agencies that cannot financially justify hiring a full-time analyst will find strategies and techniques to teach officers the methods of analysis. Introduction to Crime Analysis: Basic Resources for Criminal Justice Practice provides basic tools and step-by-step directions that will improve the skills and knowledge of new crime analysts.

crime analysis and crime mapping: GIS and Crime Mapping Spencer Chainey, Jerry Ratcliffe, 2013-04-26 The growing potential of GIS for supporting policing and crime reduction is now being recognised by a broader community. GIS can be employed at different levels to support operational policing, tactical crime mapping, detection, and wider-ranging strategic analyses. With the use of GIS for crime mapping increasing, this book provides a definitive reference. GIS and Crime Mapping provides essential information and reference material to support readers in developing and implementing crime mapping. Relevant case studies help demonstrate the key principles, concepts and applications of crime mapping. This book combines the topics of theoretical principles, GIS, analytical techniques, data processing solutions, information sharing, problem-solving approaches, map design, and organisational structures for using crime mapping for policing and crime reduction. Delivered in an accessible style, topics are covered in a manner that underpins crime mapping use in the three broad areas of operations, tactics and strategy. Provides a complete start-to-finish coverage of crime mapping, including theory, scientific methodologies, analysis techniques and design principles. Includes a comprehensive presentation of crime mapping applications for operational, tactical and strategic purposes. Includes global case studies and examples to demonstrate good practice. Co-authored by Spencer Chainey, a leading researcher and consultant on GIS and crime mapping, and Jerry Ratcliffe, a renowned professor and former police officer. This book is essential reading for crime analysts and other professionals working in intelligence roles in law enforcement or crime reduction, at the local, regional and national government levels. It is also

an excellent reference for undergraduate and Masters students taking courses in GIS, Geomatics, Crime Mapping, Crime Science, Criminal Justice and Criminology.

crime analysis and crime mapping: *Fundamentals of Crime Mapping* Rebecca Paynich, Bryan Hill, 2013-03-18 The Second Edition of the popular *Fundamentals of Crime Mapping: Principles and Practice* walks readers through the research, theories, and history of GIS in law enforcement. This accessible text explains the day-to-day practical application of crime analysis for mapping. Factual data from real crime analysis is included to reflect actual crime patterns, trends, series and what an officer or analyst can expect to see when he or she sits down to analyze and apply concepts learned. Special topics discussed include: an up-to-date discussion of the current crime trends in rural and urban areas, the major ecological theories of crime, the notion of geographic profiling, empirical research using crime mapping tools, basic mapping terminology, and more. New to the Second Edition: • All exercises and examples have been updated to reflect ArcGIS 10.0 and Excel 2010. • Includes a workbook with engaging exercises to offer hands-on application of the material. • All exercises and graphics have been updated to account for ArcGIS 10.0 and Excel 2010, though all exercises and examples for Excel 2007 remain. • Contains a NEW chapter discussing the various types of policing, with an emphasis on the Compstat process, intelligence led policing, and problem-oriented policing.

crime analysis and crime mapping: *Mapping and Analysing Crime Data* Alex Hirschfield, Kate Bowers, 2003-09-02 One of the key methods of reducing and dealing with criminal activity is to accurately gauge and then analyse the geographical distribution of crime (from small scale to large scale areas). Once the police and government know what areas suffer most from criminal activity they can assess why this is the case and then deal with it in the most effective way. Crime mapping and the spatial analysis of crime data have become recognised as powerful tools for the study and control of crime. Much of the emerging demand for more information and detailed crime pattern analysis have been driven by legislative changes, such as the UK's new Crime and Disorder Act which has placed a joint statutory duty on Police Forces and Local Authorities to produce crime and disorder audits for their areas. The book sets out methods used in the fields of Geographical Information Systems and highlights areas of best practice, examines the types of problems to which spatial crime analysis can be applied, reviews the capabilities and limitations of existing techniques, and explores the future directions of spatial crime analysis and the need for training. It centres on a series of case studies highlighting the experiences of academics and practitioners in agencies centrally involved in the partnership approach to crime prevention. Practitioners and academics not only in the UK but also worldwide should be interested in the book as an up-to-date information resource and a practical guide.

crime analysis and crime mapping: *Fundamentals of Crime Mapping: Principles and Practice* Rebecca Paynich, Bryan Hill, 2011-11-14 *Fundamentals of Crime Mapping* introduces the topic of crime mapping and the history of GIS in law enforcement. This valuable text includes a workbook for hands-on instruction. Special topics discussed include: an up-to-date discussion of the current crime trends in rural and urban areas, the major ecological theories of crime, the notion of geographic profiling, empirical research using crime mapping tools, basic mapping terminology, and more!

crime analysis and crime mapping: *Foundations of Crime Analysis* Jeffery T. Walker, Grant R. Drawve, 2018-02-12 In recent years, the fields of crime analysis and environmental criminology have grown in prominence for their advancements made in understanding crime. This book offers a theoretical and methodological introduction to crime analysis, covering the main techniques used in the analysis of crime and the foundation of crime mapping. Coverage includes discussions of: The development of crime analysis and the profession of the crime analyst, The theoretical roots of crime analysis in environmental criminology, Pertinent statistical methods for crime analysis, Spatio-temporal applications of crime analysis, Crime mapping and the intersection of crime analysis and police work, Future directions for crime analysis. Packed with case studies and including examples of specific problems faced by crime analysts, this book offers the perfect introduction to the analysis and investigation of crime. It is essential reading for students taking

courses on crime analysis, crime mapping, crime prevention, and environmental criminology. A companion website offers further resources for students, including flashcards and video and website links. For instructors, it includes chapter-by-chapter PowerPoint slides.

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crime analysis and crime mapping: *Crime Modeling and Mapping Using Geospatial Technologies* Michael Leitner, 2013-01-19 Recent years in North America have seen a rapid development in the area of crime analysis and mapping using Geographic Information Systems (GIS) technology. In 1996, the US National Institute of Justice (NIJ) established the crime mapping research center (CMRC), to promote research, evaluation, development, and dissemination of GIS technology. The long-term goal is to develop a fully functional Crime Analysis System (CAS) with standardized data collection and reporting mechanisms, tools for spatial and temporal analysis, visualization of data and much more. Among the drawbacks of current crime analysis systems is their lack of tools for spatial analysis. For this reason, spatial analysts should research which current analysis techniques (or variations of such techniques) that have been already successfully applied to other areas (e.g., epidemiology, location-allocation analysis, etc.) can also be employed to the spatial analysis of crime data. This book presents a few of those cases.

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crime analysis and crime mapping: *Mapping and Analysing Crime Data* Alex Hirschfield, Kate Bowers, 2001-04-26 One of the key methods of reducing and dealing with criminal activity is to accurately gauge and then analyse the geographical distribution of crime (from small scale to large scale areas). Once the police and government know what areas suffer most from criminal activity they can assess why this is the case and then deal with it in the most effective

crime analysis and crime mapping: *Analyzing Crime Patterns* Victor Goldsmith, Philip G. McGuire, John B. Mollenkopf, Timothy A. Ross, 1999-11-18 Crime control continues to be a growth industry, despite the drop in crime indicators throughout the nation. This volume shows how state-of-the-art geographic information systems (GIS) are revolutionizing urban law enforcement, with an award-winning program in New York City leading the way. Electronic pin mapping is used to display the incidence of crime, to stimulate effective strategies and decision making, and to evaluate the impact of recent activity applied to hotspots. The expert information presented by 12 contributors will guide departments without such tools to understand the latest technologies and successfully employ them. Besides describing and assessing cutting-edge techniques of crime mapping, this book emphasizes: * the organizational and intellectual contexts in which spatial analysis of crime takes place, * the technical problems of defining, measuring, interpreting, and predicting spatial concentrations of crime, * the common use of New York City crime data, and * practical applications of what is known (e.g., a review of mapping and analysis software packages using the same data set). Students, academics, researchers, practitioners, and policymakers in the areas of criminal justice, corrections, geography, social problems, law and government, public administration, and public policy analysis will need to look at the interdisciplinary nature of both GIS and spatial dimensions of crime in order to comprehend the variety of different approaches address important analytic problems, reassess public facilities and resources, and prepare to respond more quickly to emerging hotspots.

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experienced rapid growth, particularly since the mid 1990s. There has also been increasing interests in GIS analysis of crime from various academic fields including criminology, geography, urban planning, information science and others. Geographic Information Systems and Crime Analysis features a diverse array of GIS applications in crime analysis, from general issues such as GIS as a communication process and inter-jurisdictional data sharing to specific applications in tracking serial killers and predicting juvenile violence.

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crime analysis and crime mapping: Applied Crime Analysis Wayne Petherick, 2014-06-12 Most approaches to crime analysis focus on geographical crime mapping, which is helpful in identifying crime clusters and allocating police resources, but does not explain why a particular crime took place. Applied Crime Analysis presents a model that brings statistical anchoring, behavioral psychopathology, and victimology from the social sciences together with physical and crime scene evidence to provide a complete picture of crime. This hands-on guide takes theoretical principles and demonstrates how they can be put into practice using real case examples. In addition to covering key topics such as staged crime scenes, false reports, and criminal motivations, the book's includes a final chapter on report writing, showing readers how to use their findings to successfully advance to prosecution and succeed in court. - Presents a model that takes social science concepts, including statistical anchoring, behavioral psychopathology, and victimology and connects them with crime scene evidence to examine and analyze crime - Puts crime analysis theory into practice with real-world examples highlighting important concepts and best practice - Includes a report writing chapter to demonstrate how this approach can strengthen criminal cases and succeed in court - Instructor materials include a Test Bank, Powerpoint lecture slides, and Instructor's Guide for each chapter

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and explores ways to organize statistical data, crime analysis methodologies, crime prevention theories, and methods of determining patterns and trends. By explaining the significance of crime statistics relative to crime prevention theory and techniques, the book provides readers with a clear, strategic plan to implement crime prevention programs and security resources. Discusses crime analysis techniques and theories in detail Covers all aspects of crime analysis for private sector businesses Uses fictional case studies found throughout chapters that help readers apply statistical data to practical, everyday use

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crime analysis and crime mapping: *Stratified Policing* Roberto Santos, Rachel Santos, 2020-12-11 Implementing effective crime reduction requires deliberate thought and effort to integrate processes into the police organization, its culture, and the day-to-day work. Stratified Policing: An Organizational Model for Proactive Crime Reduction and Accountability provides police leaders a clear path for institutionalization of crime reduction modeled after current police processes. It sets up an organization to more easily incorporate evidence-based strategies into everyday operations with the goal of changing a police organization from reactive to proactive. Stratified Policing incorporates what works for crime reduction and how to realistically make it work in police practice. The book details the specific and adaptable framework that infuses small changes by rank and division into daily activities that build on each other resulting in a comprehensive and focused approach for crime reduction. It also lays out a multifaceted accountability process that is fair and transparent. Importantly, the book dedicates entire chapters to methods for developing

crime reduction goals, addressing immediate, short-term, and long-term crime and disorder problems, and implementing a stratified accountability meeting structure. Chapters include specific recommendations supported by research and grounded in what is realistic in police practice for application of evidence-based strategies, assignment of responsibility and accountability, crime analysis products, and assessment measures for impact on crime and disorder. The book is a culmination of the authors' 15 years of work and will synthesize their research, other publications on stratified policing, and provide new material for police leaders and professionals who are seeking an organizational structure to institutionalize crime reduction strategies into their day to day operations.

crime analysis and crime mapping: Environmental Criminology and Crime Analysis

Richard Wortley, Lorraine Mazerolle, 2013-05-13 Environmental criminology is a generic label that covers a range of overlapping perspectives. At the core, the various strands of environmental criminology are bound by a common focus on the role that the immediate environment plays in the performance of crime, and a conviction that careful analyses of these environmental influences are the key to the effective investigation, control and prevention of crime. Environmental Crime and Crime Analysis brings together for the first time the key contributions to environmental criminology to comprehensively define the field and synthesize the concepts and ideas surrounding environmental criminology. The chapters are written by leading theorists and practitioners in the field. Each chapter will analyze one of the twelve major elements of environmental criminology and crime analysis. This book will be essential reading for both practitioners and undergraduate and postgraduate students taking courses in this subject.

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much-needed and timely in-depth synopsis of this emerging movement in a practical and accessible style.

crime analysis and crime mapping: Space, Time, and Crime Timothy C. Hart, Kim Michelle Lersch, 2015 Interest in the spatial distribution of crime and criminals has experienced a virtual explosion over the past several years. In *Space, Time, and Crime*, the authors provide an overview of the various theoretical explanations, crime control policies, and practical investigative tools used to identify high crime places, spaces, and times. Throughout the text, Lersch and Hart strive to provide a highly readable, informative discussion of the important issues surrounding the geography of crime, providing real world examples as well as illustrations from previously published research. *Space, Time, and Crime* provides a basic overview of the more popular theories that have been used to explain the concentration of crime in certain places and times. Each theory is carefully and clearly developed from its historical roots to contemporary applications, with solid research cited throughout the discussions. The reader is then moved from theory into practice, where a summary and critique of a number of various theoretically-driven practical policy applications are presented. The basic elements of crime analysis and crime mapping, both very popular crime fighting tools for police agencies and place managers, are presented. Finally, the book closes with a strong Marxist-based critique of the various theories, policies, and tools, leaving the reader with some troubling questions to ponder. This fourth edition updates and expands the third edition by including dozens of figures and images that help visualize criminological research, essentially bringing the real-world of research to the reader and into the classroom. This new edition also incorporates new sections on some of the most recent advancements in the study of space, time, and crime, including a review of Risk Terrain Modeling (RTM) and Situational Action Theory (SAT). Finally, this new edition has incorporated empirical scholarship from over 50 new/updated sources, providing the reader with the most up-to-date topics discussed by the authors. PowerPoint slides are available upon adoption. Sample slides from the full, 203-slide presentation are available to view [here](mailto:bhall@cap-press.com). Email bhall@cap-press.com for more information. Praise for earlier editions: One of the best features of this text is its readability, coupled with the logical development of theoretical interpretation. *Space, Time, and Crime* is crafted to encourage students to examine familiar concepts from a distinctive perspective -- one that frames theory logically to enhance students' understanding of the unique and powerful relationship between crime and place. -- Mary Ann Eastep, University of Central Florida The authors provide broad coverage of topics addressing the understanding, analysis and response to the geographic patterns of crime. They include helpful historical coverage of many criminological theories pertinent to the understanding of crimes at places and variation of crime across space. Lersch and Hart also discuss crime data sources and introduce applied crime mapping and crime analysis techniques and topics, as well as applications and criminal justice responses to crime in hot spots. Of note is an unusual presentation of the complexities and conflicting evidence provided by geographic restrictions and mapping of sex offenders. -- Tammy Kochel, Southern Illinois University

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fear mapping with police-community partnerships and emerging avenues for further research. Issues discussed include fear of crime in relation to housing prices and disorder, the use of fear mapping as a means with which to monitor the impact of Closed Circuit Television (CCTV) and fear mapping in transit environments.

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