D23 Geographical Spatial Analysis of Homicide Offenders' Residences in Baton Rouge, Louisiana: An Example of How to Use GIS in Forensic Investigations

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After attending this presentation, attendees will gain knowledge of how a GIS (Geographic Information System) can be created to aid in forensic investigations. Also, attendees will learn how GIS can provide investigators with statistical results in map-form. The resulting maps provide insight into how features in the landscape affect human behavior.

This presentation will impact the forensic science community by showing attendees the process of identifying central points and hot spots associated with where homicide offenders once lived in Baton Rouge, Louisiana. From the generated maps identifying the highest concentration of offender residences, researchers and members of law enforcement will gain a necessary understanding for applying Central Crime Theory to homicides occurring outside of Baton Rouge (Chainey & Ratcliffe, 2005).[1] Also, attendees will learn how statistical spatial analysis can be used to determine if offenders' residences are clustered or dispersed.

Homicides involve a minimum of two individuals–the victim and the offender–yet a majority of the geographical discussions on homicides only reference the location where the victim's body was found. Rather than focusing on the geographical areas associated with homicide victims, this presentation focuses on the geographical areas associated with offenders. Often criminals will operate from an anchor point that he or she feels comfortable with. The criminal will leave the anchor point to commit the crime and then return to the anchor point because it is the offender's "safe haven." Often the anchor point is the offender's residence, so comparing the geographic distributions of homicide offenders' residences within a certain area can offer a new approach to learning about the criminal activity within the area as well.

The Baton Rouge Sherriff's Office provided the addresses for the residences of offenders committing homicides in Baton Rouge, Louisiana, between 1991 and 1997. The addresses were geocoded and assigned X and Y geographic coordinates, which resulted in 304 point locations. A GIS was created using these points, and CrimeStat 3.1 and ArcMap 9.3 were used to analyze the geographical distributions of homicide offenders' residences. The results were obtained using various techniques associated with three different types of statistical spatial analysis: Descriptive spatial statistics, nearest neighbor analysis, and spatial cluster analysis.

The results from this research indicate that homicide offenders in Baton Rouge tend to live in one generalized location in the northern point of the city. The spatial analysis from this research also indicates that the presence of major features in the landscape (e.g., Mississippi River, Interstate 10, shopping malls, etcetera) influenced the overall spatial distribution of where homicide offenders reside. Awareness of how features in the landscape can influence human behavior is an important component to any criminal investigation, and the use of GIS can aid in the identification of these influences.

References:

1. Chainey, S. and Ratcliffe, J. 2005. GIS and Crime Mapping. Cichester, West Sussex, England: John Wiley & Sons.

GIS, Spatial Analysis, Homicide Offender

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