Density Mapping

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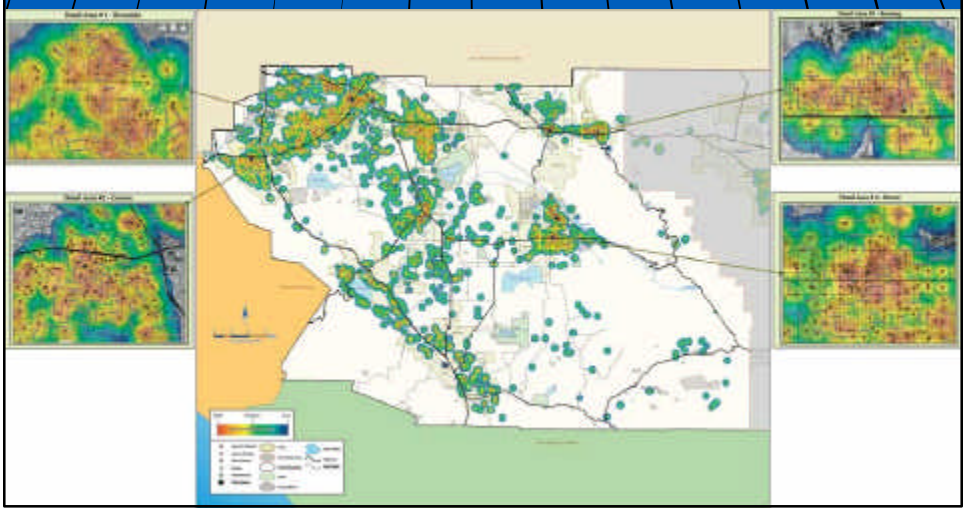
Abstract

- Density Mapping - You have a lot of dots on your map representing scores of crimes, but have you ever wondered about the density of crime in your jurisdiction? When we calculate density we spread point values out over our surface or landscape. Our surface is modeled as a raster data set in grid cells and then we calculate values or density for each cell. In this class we will discuss raster data models, density, and various techniques for calculating and mapping crime density.

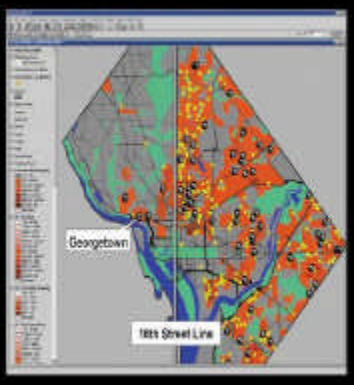


Outline

- Why are we here?
- What is density mapping?
- Understanding raster data models
- Surfaces
- Calculations
- Parameters
- Output
- Questions?

Why are we here?

- You saw this title and you've been wondering what this density mapping thing is all about.
- You've tried density mapping but the instructions are written in a seemingly foreign language.
- You have so much crime that density is the only way to illustrate the problem.



What is density mapping?

- Everyone should have a handle on point symbol and area symbol (choropleth) mapping.
- You may have done density mapping using points in polygons, e.g., crimes in reporting districts divided by population.
- You may calculate population per square mile (population / area) in census tracts to calculate density.

Understanding raster data models

- Understanding raster data
- Coordinate space
- Discrete and continuous data
- Spatial resolution
- Raster encoding
- Raster data and attributes

Raster datasets

- Thematic data
  - Insert sample
  - **What do rasters represent?**
  - A raster can represent:
  - Thematic data such as land use, or soils
  - Continuous data including temperature or elevation, or spectral data such as satellite images and aerial photographs
  - Pictures such as scanned maps or drawings, and building photographs
- Image data

Discrete vs. Continuous Surfaces

- Most GIS applications use discrete geographic information such as land ownership, soils classification, zoning, and land use. These types of data are represented by nominal, ordinal, interval, and ratio values representing thematic data.
- Surfaces are continuous data such as elevation, rainfall, pollution concentration, and water tables. These data can be represented as a continuous surface, generally without sharp or abrupt changes.