

Analysis and Geoprocessing: Using Spatial Statistics

Goals of the workshop

- Explain what spatial statistics are and how they differ from traditional (nonspatial) statistics.
- Introduce a variety of core spatial statistics tools available in ArcGIS.
- Present strategies for navigating the spatial statistics toolbox to help quickly identify the most effective tools to use for the questions that need to be answered.
- Demonstrate the utility of spatial statistics for a wide range of application areas.
- Outline additional resources for learning more about spatial statistics and statistical analyses.

Major topics covered

- Spatial statistics are not difficult to use; in many ways, they extend what the eyes and mind do intuitively to assess spatial patterns, trends, and relationships.
- Unlike traditional statistical methods, spatial statistics use space (proximity, distance, area, length, spatial relationships, etc.) directly in their mathematics.
- Spatial thinking and statistical analysis are components of the Geographic Approach; they bring a powerful analytic perspective to GIS-centered spatial data analysis.
- The form and format of spatial data (feature type, database structure, and aggregation scheme, for example) have implications for the types of questions we can ask, how we interpret results, and which analytic techniques will be most appropriate.
- Descriptive statistics, like Mean Center and Standard Deviational Ellipse, summarize the salient characteristics of a spatial distribution.
- Spatial statistics can help assess broad geographic patterns to quantify, for example, the degree to which geographic features cluster together in space.
- Hot Spot and Outlier Analysis have broad applications for a variety of fields including public health, public safety, business, conservation, government, education, and natural resources. Before performing these analyses, it is important to identify the appropriate analysis field and determine an effective scale of analysis.
- Pattern analysis tools in ArcGIS 9.2 answer questions about when, where, and how. New tools in ArcGIS 9.3 extend analytic capabilities to help answer questions about why.