Spatial Analysis with ArcGIS Pro
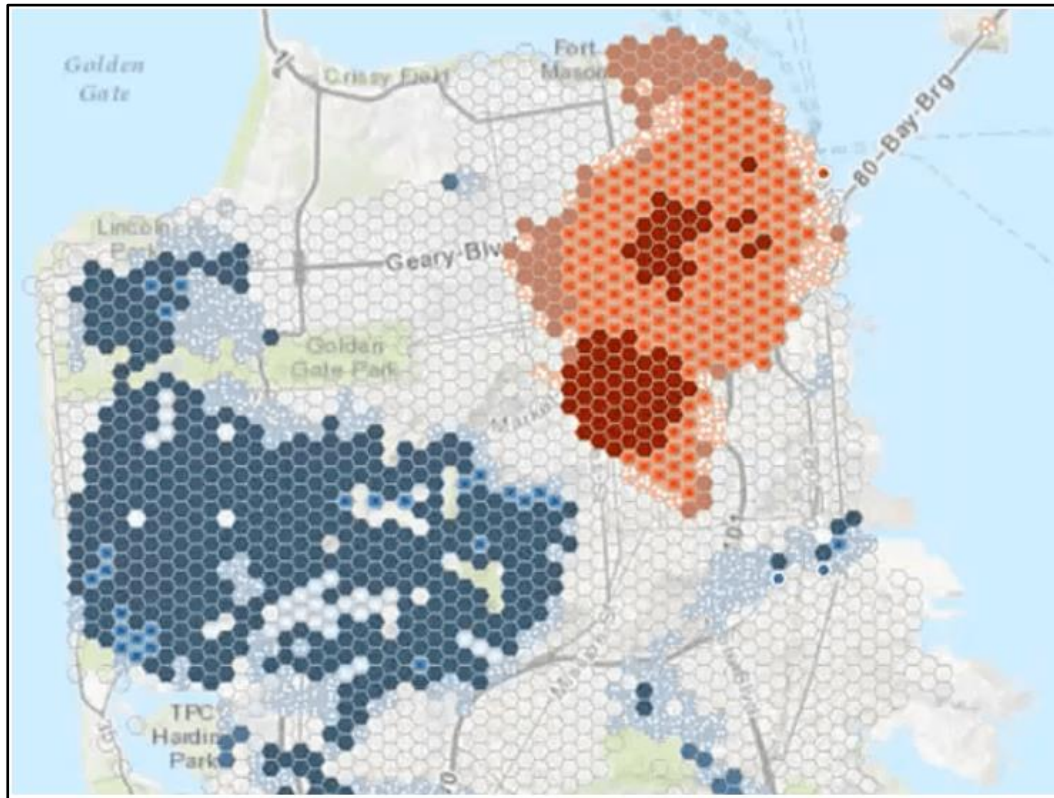
Level: Intermediate | Course duration: 3 days

Identify patterns, make predictions and answer questions about your data.

What is the course about?

Learn essential concepts and a standard workflow you can apply to any spatial analysis project. You will work with a variety of ArcGIS tools to explore, analyze, and produce reliable information from data. Course exercises use an Advanced license of ArcGIS Pro and ArcGIS 3D Analyst, ArcGIS Spatial Analyst and ArcGIS Geostatistical Analyst.

Who is the target audience?

ArcGIS users who want to identify patterns, make predictions and answer questions about your data.

Are there any prerequisites?

- Completion of ArcGIS Pro: Essential Workflows or equivalent knowledge is required

What skills will I learn?

After completing this course, you will be able to:

- Quantify spatial patterns using spatial statistics and analyze change over time to identify emerging hot spots
- Use interpolation and regression analysis to explain why patterns occur and predict how patterns will change
- Prepare data and choose appropriate tools and settings for an analysis
- Examine features and distribution patterns within an area of interest and identify optimal locations using 2D and 3D analysis tools

Course topics

Building a foundation for spatial analysis

- Benefits of spatial analysis
- Common analysis problems
- Spatial analysis tools
- Spatial analysis workflow
- Applying spatial analysis

Planning and preparing for spatial analysis

- Data properties
- Raster data considerations
- Environment settings
- Prepare data for analysis

Proximity analysis

- Using proximity in everyday life
- Choosing the best distance measure
- Ways to measure distance
- Outputs of proximity analysis
- Buffering using different distance measures
- Measuring cost
- Analyze proximity

Overlay analysis

- Introducing overlay
- How overlay works
- Overlay tools
- Choosing the appropriate tool
- Perform overlay analysis

Automating spatial analysis

- Automating workflows
- Automation methods in ArcGIS Pro
- Batch geoprocessing
- Build a model
- Automating and sharing models
- Use a model to process multiple inputs

Creating surfaces using interpolation

- Tobler's First Law of Geography
- Interpolation methods
- Interpolation tools
- Deterministic interpolation
- Interpolate surfaces

Suitability modeling

- Suitability modeling workflow
- Evaluating analysis criteria
- Choosing vector or raster overlay
- Deriving surfaces from other sources
- Raster functions and geoprocessing tools
- Levels of measurement
- Transforming values to a common scale
- Types of raster overlay
- The Raster Calculator
- Locating and analyzing results
- Exploring data sources

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Course topics (cont.)

Spatial statistics

- Spatial patterns
- Types of spatial statistics
- Interpreting inferential statistics
- Descriptive versus inferential
- Spatial statistics tools
- Clusters and outliers
- Clustering tools

Space-time analysis

- Incorporating time into your own analysis
- Temporal analysis
- Emerging hot spot analysis
- Space-time analysis workflow
- Explore space-time pattern mining tools

Regression analysis

- Explaining spatial patterns
- Causes of spatial patterns
- Regression equation
- OLS regression
- Checkpoint
- Interpreting OLS diagnostics
- Six OLS checks
- OLS reports Exploratory regression
- Enriching data for analysis

Geographically weighted regression

- How relationships change over space
- GWR characteristics
- When to use GWR
- GWR in action
- Perform GWR

Geostatistical interpolation

- Deterministic interpolation
- Geostatistical interpolation
- Kriging
- Empirical Bayesian kriging (EBK)

3D analysis

- When to use 3D analysis
- 3D analysis examples
- Interactive 3D analysis
- Perform 3D analysis