

## **Performing Regression Analysis Using Raster Data (Sessions 1012 / 1410)**

### **Goals of the workshop**

- Provide an understanding of how regression analysis can accentuate GIS analysis.
- Give a basic overview of the concepts underlying regression analysis.
- Identify the differences between linear, logistics, and spatial regression.
- Demonstrate how to use a classical regression analysis with raster data and the issues involved.
- Illustrate how to use the output coefficients from a regression to create preference and probability raster surfaces.
- Through demonstrations walk through the workflows on how to perform a regression analysis.

### **Major topics covered**

- Determine when to use regression analysis with spatial data and the problems it solves.
- Define the theory behind the regression
  - Dependent variables
  - Independent variables
- Discuss the difference between linear and logistics regression and identify the issues with each.
- Present the workflow and decision points when performing a regression analysis:
  - Identify dependent variable
  - Determine significant independent variables
  - Sample data to reduce spatial autocorrelation
  - Perform diagnostics on the output results
  - Use coefficients to produce a continuous surface.
- Examine spatial autocorrelation and its significance when performing a regression analysis -- a classical statistics.
- Explore different sampling strategies to reduce the effects of spatial autocorrelation.
- Demonstrate how spatial regression incorporates spatial autocorrelation into the calculations thus resulting in a smoother output surface.
- Demonstrate how to perform a regression analysis within ArcGIS.
- Identify the different statistical software packages can be used to perform the regression analysis.