ArcGIS Pro: What’s New in Analysis

James Sullivan
What is analysis?

Analysis transforms raw data into information or knowledge.

*Spatial analysis* does this for geographic or spatial data.

Spatial analysis answers “where” questions.

Where is the best location for a new community center?
Where is an area with high crime rates?
Where has the landscape changed in the last 10 years?
Analysis in ArcGIS Desktop

Make analysis easy

Single tools that run common workflows like summarizing within an area, aggregating points, etc.

Make it fast

More tools using parallel processing
Continual improvements to vector overlay

With better/more correct analysis results

Better distance calculations/geodesic
Analysis in ArcGIS Pro

ArcGIS Pro provides incredible capabilities for performing analysis in 2d and 3d.

Performance (~20%) + scalability + visualization

Geoprocessing
Raster analysis
Network analysis
3d analysis
Statistical analysis
Analysis in ArcGIS Pro

The *ANALYSIS* ribbon tab provides access to:

- Gallery of powerful analytic tools
- Suite of all geoprocessing tools
- Python command line
- ModelBuilder
- Network analysis
- Imagery processing
Geoprocessing
Processing geographic data
What is geoprocessing?

**Geoprocessing** is a rich suite of tools for **processing geographic data**.
Spatial analysis + manage GIS data

A typical geoprocessing tool processes input data and produces an output.
E.g. Buffer a map layer to create areas around the layer’s features

You can model and automate geoprocessing workflows using ModelBuilder or Python.
Geoprocessing in ArcGIS Pro

Familiar user experience with some key productivity improvements.

Most tools, models, and Python scripts that work in ArcMap will work in Pro.
ArcObjects-based custom tools are not supported.

Analyze for Pro tool checks models and scripts for unsupported tools, data, and Python code.
Geoprocessing pane

You find and run geoprocessing tools in the Geoprocessing pane.

A dockable pane where you can…
- search for a specific tool
- see favorite and recently run tools
- browse a list of all tools

After finding the right tool, the tool dialog opens in the pane.
- Your map remains the focus.
Create a geoprocessing workflow

Make a Python script tool that runs Python code
To get started, run the tool in Pro, then *Copy Python command* and paste into script file.

Build a model of your workflow using ModelBuilder.
Connect tools and data to form a diagram that represents your workflow.
Geoprocessing Demo
Raster Analysis
Spatial Analyst extension
Raster analysis

Spatial Analyst includes 170+ geoprocessing tools.

Integrates both vector and raster spatial analysis.

Range of applications including suitability modeling, hydrological analysis, surface interpolation, and more.

Powerful map algebra language

Raster Calculator
Improved user experience of tools and controls access to key raster analysis environments

- Cellsize, snap raster, mask, etc.

More tools use parallel processing/multi-core

- Reclassify, Weighted Overlay, Zonal Statistics

New tools in ArcGIS Desktop

- Rescale By Function, geodesic Viewshed, and Classification
Wind power suitability

Demo
Network analysis
Network Analysis

Routing / Directions
Closest facility
Drive-time / service areas
Location – Allocation
Vehicle routing problem
Origin – Destination matrix
Network analysis in ArcGIS Pro

2D and 3D network analysis

Start with Analysis > Network Analysis > Service Area or Route

Contextual ribbon tab for different network analysis layers
  Add locations, configure, and run

Other analysis accomplished through geoprocessing tools in Network Analyst
Network analysis services

Don’t have your own network data or don’t know how to use it? Use ArcGIS ready-to-use services

Requires ArcGIS Organizational account; credits consumed

Services use premium street network data with historical current traffic estimates and world-wide coverage.

http://logistics.arcgis.com/arcgis/services
Network analysis

Demo
3D Analysis
3D Analyst extension

100+ geoprocessing tools for elevation surface creation and analysis, using vectors, rasters and TIN-based models.

Support for analysis and visualization of Lidar and point-cloud data through the LAS dataset.

Measuring distances/proximity and evaluating spatial relationships in 3D.

Volumetric and visibility analysis
3D analysis

New tools in ArcGIS Desktop

Classify LAS By Height
Lidar point classification relative to height above ground
Example: characterize vertical structure of tree canopy

Locate LAS Points By Proximity
Find 3D distance between LAS points and other features or multipatch faces
Example: identify right of way encroachments such as vegetation close to power lines

LAS Point Statistics By Area
Min, max, mean, stdev of z for points within polygons
Example: find max height of all LAS points within building footprints
3D Analysis
Demo
Statistical analysis
Spatial and geostatistics
Interactive modeling tools for creating statistically valid prediction surfaces along with prediction uncertainties.

Predict between known measurements – interpolation

Off-the-shelf tools for calculating extremely accurate interpolation surfaces without configuration of statistical models.

Empirical Bayesian Kriging

No Geostatistical Wizard in first release of Pro – only the existing geoprocessing tools.
Spatial Statistics

Tools for analyzing spatial distributions, patterns, processes and relationships in 2D, 3D, and 4D (time)

- Summarize key characteristics of a spatial distribution
- Identify significant clusters and outliers
- Model and explore spatial relationship through regression

New tools in ArcGIS Pro

- Create Space Time Cube: Aggregates data into multidimensional data structure
- Emerging Hot Spot Analysis: Identify hot and cold spot trends – new, intensifying, diminishing, sporadic, etc.
Statistical analysis
Demo
Learn more about spatial analysis

Don’t forget to complete a session evaluation form!
Print your customized Certificate of Attendance!

Printing stations located on L St. Bridge, next to registration
GIS Solutions EXPO, Hall D

Monday, 12:30pm – 6:30pm
Tuesday, 10:45 AM–4:00 PM
• Exhibitors
• Hands-On Learning Lab
• Technical & Extended Support
• Demo Theater
• Esri Showcase
Networking Reception:

National Museum of American History

Tuesday, 6:30 PM–9:30 PM
Bus Pickup located on L Street
Interested in diving deeper into Esri technology?

Add a day to your Fed GIS experience and register to attend the Esri DevSummit Washington DC. Stop by the registration counter to sign up.
Understanding our world.