Introduction to Spatial Analysis in ArcGIS Online

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Topics

• Introducing ArcGIS Online Spatial Analysis

• ArcGIS Online Spatial Analysis Workflow

• Demos and examples
  - Using ArcGIS Online Analysis to Solve Problems

• Wrap up

• Q&A
Introducing ArcGIS Online Spatial Analysis
ArcGIS Online Spatial Analysis

What is it?

• Integrate analytics into ArcGIS Online for your organization's workflows
  - Everything runs in the cloud using ArcGIS Online
  - Ready to use content

• Use analysis tools to quickly, easily, and intuitively:
  - Discover relationships, patterns, and trends in data
  - Answer questions in a meaningful way
ArcGIS Online Spatial Analysis
What is the value?

- Embracing Web GIS
- New and better ways to perform spatial analysis
  - Solutions based
  - Content and services
  - Easy and Intuitive
What do you need?

- ArcGIS Online Organizational account
- Role privileges:
  - Create items
  - Publish hosted features
  - Premium Content
  - Network Analysis
  - Spatial Analysis
  - GeoEnrichment
  - Demographics
  - Elevation Analysis
- Credits
ArcGIS Online Spatial Analysis Tools

Perform Analysis
- Summarize Data
- Find Locations
- Data Enrichment
- Analyze Patterns
- Use Proximity
- Manage Data
Summarize Data

• Calculate summary statistics for features and attributes

Number of schools by zip code
Data Enrichment

- Explore the character of areas
- Add detailed demographic data and statistics to your analysis

Who lives in the neighborhood surrounding each Starbucks store?
Use Proximity

• "What is near what?"

Earthquake events
Create buffers

Drive-time areas
Manage Data

- Manage geographic data, and combine prior to analysis

Ohio hospitals—extract data
ArcGIS Online Spatial Analysis
Release Update

• Incremental release with each ArcGIS Online quarterly update

• New in last year:
  - Join Features
  - Find Outliers
  - Better sharing experience with network analysis results

• Latest release: June 2017
  - 26 workflows
  - Rerun analysis workflows
ArcGIS Online Analysis Workflow
ArcGIS Online Analysis Workflow

Prepare data ➔ Add to map ➔ Perform analysis ➔ Review results ➔ Rerun analysis
Assemble data

- Evaluate analysis needs
- Search local and online resources
- Create, publish, and filter data

Supported data types

- Feature service
- Map service with feature layers
- ArcGIS Online Map Notes
- ArcGIS Online Route layers
- Comma-separated values (CSV) file (.csv)
- GPS exchange format file (.gpx)
- Shapefile (.zip)
- GeoRSS web feed
- WFS layers
Update map

- Bring data into ArcGIS Online map viewer
- Optionally
  - Set symbology, map display extent, and bookmarks
  - Save map

Living Atlas Analysis Layers and custom analysis layers do not need to be added to map
Analyze data

- Open Analysis tools
- Determine appropriate tool(s)

Perform analysis

Summarize Nearby

Finds features that are within a specified distance of features in the input layer. Distance can be measured along straight lines or viable paths of a travel mode. Statistics are then calculated for the nearby features. For example:

- Calculate the total population within five minutes of a proposed new store location.
- Calculate the number of freeway access ramps within five minutes of a proposed new store location to use as a measure of store accessibility.
Analyze data

- Determine appropriate tool(s)
- Apply parameters
Use and review results

- Added to web map
- Published as hosted feature services within the organization
- Configure results layer – pop-ups, symbology
- Share the results
# Adding Analysis to Web Apps using Web AppBuilder for ArcGIS

## Analysis Tools

<table>
<thead>
<tr>
<th>Name</th>
<th>Settings</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aggregate Points</strong></td>
<td><img src="image" alt="Settings" /> <img src="image" alt="Usage" /></td>
<td>Aggregate points into polygons where the points are located.</td>
</tr>
</tbody>
</table>

- **The tool display name:** Aggregate Points
- **Show help links in the widget:**
- **Show option to use the current map extent:**
- **Display Show credits option:**
- **Save the result in user's account:**
- **Show ready to use layers from ArcGIS Online Living Atlas of the world:**
- **Allow to export results:**

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<td><strong>Calculate Density</strong></td>
<td><img src="image" alt="Settings" /> <img src="image" alt="Usage" /></td>
<td>Create a density map from point or line features by spreading known quantities of some phenomenon (represented as attributes of the points or lines) across the map.</td>
</tr>
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<td><strong>Choose Best Facilities</strong></td>
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</table>

Review results
Adding Analysis to Web Apps using Web AppBuilder for ArcGIS

Create Buffers

1. Choose layer containing features to buffer
   - State park

2. Enter buffer size
   - Distance: 3 miles
   - Field: Separate by species (2, 3, 5)

3. Result layer name
   - State ParkBuffer

Save result in UC2017

Options

Messages

Outputs
State ParkBuffer

Note: Feature and table outputs are added in the map as operational layers.

Back Home
Re-run analysis

- Analysis can be re-run from a result layer
- All the previous parameters will be honored
- The tool can be rerun with the same parameters, or the parameters can be updated
Demos – Using ArcGIS Online Analysis to Solve Problems
Investigating response time

Create drive-time areas using traffic conditions
Demo Scenario

Find the areas of the city within a four-minute drive time
Demonstration review

- Add current data
- Perform analysis (Fire Stations)
  - Traffic: Tuesday 2 AM
  - Traffic: Friday 5 PM
- Rerun analysis
- Review results
- Fire Stations
- Create Drive-Time Areas
- Drive-Time Area
- Create Drive-Time Areas
- Drive-Time Area
Analyzing invasive species
Summarize affected areas near campgrounds
Demo Scenario

Determine which campgrounds are near areas affected by an invasive weed
Demonstration review

1. Add current data
2. Perform analysis (Campgrounds and N. Tussock)
3. Update layer style
4. Review results

- Campgrounds
- Nasella Tussock
- Summarize Nearby
- Area of invasive species
Demonstration review

Add current data

Perform analysis
  • Maximize coverage
  • Choose from existing locations
  • Choose four locations

Review results

Existing Clinics
Library locations
Census block group centroids

Choose Best Facilities
Demo

Summarize house sales per zip code
Determine what is the average sales price per zip code in the area?
Demonstration review

Add data

Perform analysis

US Zip codes (Living Atlas Analysis Layer)

Review results

List of houses sold (.csv table)

Join Features

Home sales summarized by zip
Choose best facilities
Minimize travel cost & Maximize Demand Served
Demo Scenario

Find the best locations for additional clinics
Demo
School Obesity Analysis
Demonstration review

1. Add data → Public schools with obesity rates
2. Perform analysis → Aggregate Points → Which neighborhoods have higher or lower obesity?
3. Perform analysis → Hex bins (10KM & 1KM)
4. Perform analysis → Create Hotspots → Statistical Significant Hotspots & Coldspots
5. Perform analysis → Hex bins (10KM & 1KM)
6. Perform analysis → Calculate Density → Fast food Density
7. Perform analysis → Fast food restaurants
8. Perform analysis → Enrich Layer → Median Income
9. Perform analysis → Add Std. Pred Error
10. Perform analysis → Interpolate Points → Interpolated surface predicting Obesity
11. Review results → Share Web Map
12. Review results → Create Web Application → Comparative Analysis
Wrap up
Summary

- Spatial analysis adds valuable insight by providing hosted tools that work with your data in your ArcGIS Online organization

- Performing spatial analysis online is easy and intuitive

- Use ArcGIS Online spatial analysis to discover geographic relationships, patterns, and trends
ArcGIS Online Spatial Analysis

What’s next?

• Continue to improve rerun analysis experience
• Charts
• New Analysis tools
• Chaining analysis functions
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