



Introduction to Spatial Analysis in ArcGIS Online

Jian Lange, Vicki Lynn Cove

**GIS
INSPIRING
WHAT'S
NEXT**

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**

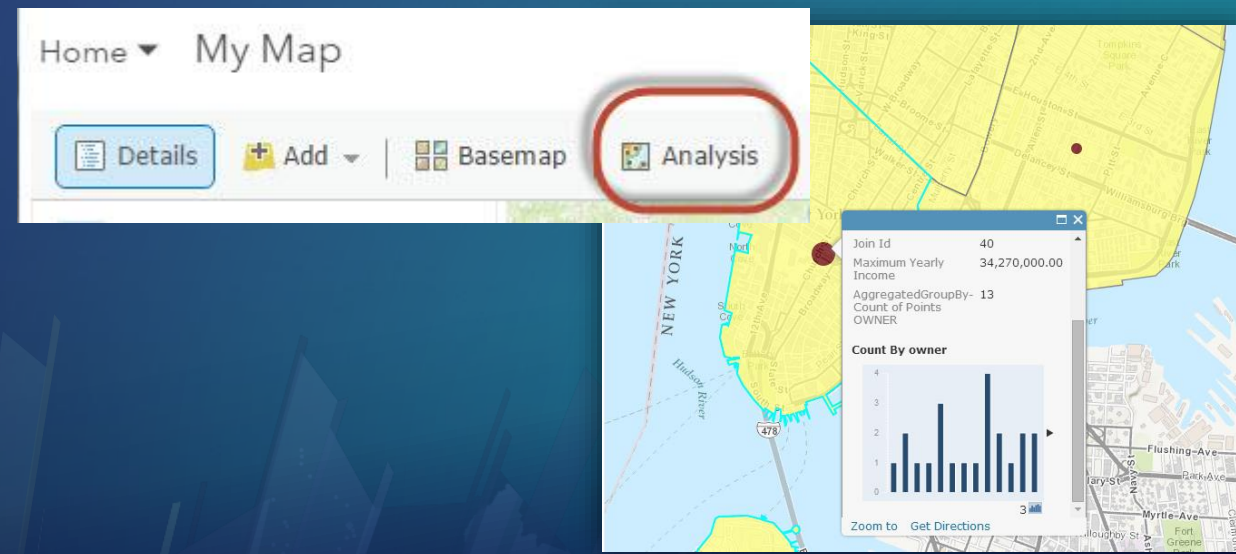
Introduction



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
 - Find best locations and routes
 - Gain value from your location data to make the best decisions



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

The screenshot displays the ArcGIS Online Spatial Analysis interface. On the left, a menu titled "Perform Analysis" is expanded to show "Summarize Data" options: "Aggregate Points", "Join Features", "Summarize Nearby", and "Summarize Within". Below this are other menu items: "Find Locations", "Data Enrichment", "Analyze Patterns", "Use Proximity", and "Manage Data". On the right, a map of Los Angeles is shown with a hexagonal grid overlay. A popup window titled "LA Median Household Income" is open, displaying a table and a bar chart. The table shows the 2015 Median Household Income for the County of Los Angeles as \$55,909.00. The bar chart compares this to a specific area's income of \$39,253.00.

LA Median Household Income	
2015 Median Household Income	39,253.00
County Median Household Income	55,909.00

ArcGIS Online Spatial Analysis

What do you need?

- ArcGIS Online Organizational account
- Level 2 user
- Role privileges:
 - Create items
 - Publish hosted features
 - Premium Content
 - Network Analysis
 - Spatial Analysis
 - GeoEnrichment
 - Demographics
 - Elevation Analysis
- Credits

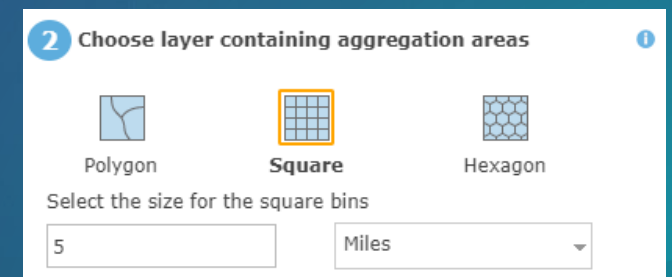
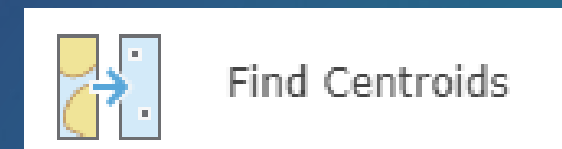
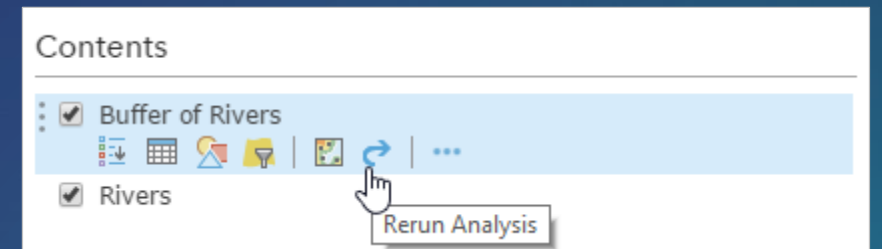
The screenshot displays the 'General Privileges' and 'Administrative Privileges' sections of an ArcGIS Online role configuration page. The 'General Privileges' section is expanded to show various permissions across several categories: Members, Groups, Content, Sharing, Premium Content, Features, and Open Data. The 'Administrative Privileges' section is also expanded to show permissions for Members, Groups, Content, and ArcGIS Marketplace Subscriptions. Each category has a collapse icon ([-]) and a checked checkbox (☑) indicating that the category is active. The permissions listed include actions like 'View', 'Create, update, and delete', 'Share with organization', 'Geocoding', 'Network Analysis', 'Spatial Analysis', 'GeoEnrichment', 'Demographics', 'Elevation Analysis', 'Edit', and 'Manage Open Data site(s)'. The 'Administrative Privileges' section includes permissions like 'View all', 'Update', 'Delete', 'Reassign ownership', 'Assign members', 'Link to enterprise group', 'Create with update capabilities', 'Request purchase information', and 'Start trials'.

General Privileges		
[-] ☑ Members <ul style="list-style-type: none"><input checked="" type="checkbox"/> View	[-] ☑ Groups <ul style="list-style-type: none"><input checked="" type="checkbox"/> Create, update, and delete<input checked="" type="checkbox"/> Join organizational groups<input checked="" type="checkbox"/> Join external groups<input checked="" type="checkbox"/> View groups shared with organization	[-] ☑ Content <ul style="list-style-type: none"><input checked="" type="checkbox"/> Create, update, and delete<input checked="" type="checkbox"/> Publish hosted feature layers<input checked="" type="checkbox"/> Publish hosted tile layers<input checked="" type="checkbox"/> Publish hosted scene layers<input checked="" type="checkbox"/> View content shared with organization
[-] ☑ Sharing <ul style="list-style-type: none"><input checked="" type="checkbox"/> Share with groups<input checked="" type="checkbox"/> Share with organization<input checked="" type="checkbox"/> Share with public<input checked="" type="checkbox"/> Make groups visible to organization<input checked="" type="checkbox"/> Make groups visible to public<input type="checkbox"/> Make groups available to Open Data	[-] ☑ Premium Content <ul style="list-style-type: none"><input checked="" type="checkbox"/> Geocoding<input checked="" type="checkbox"/> Network Analysis<input checked="" type="checkbox"/> Spatial Analysis<input checked="" type="checkbox"/> GeoEnrichment<input checked="" type="checkbox"/> Demographics<input checked="" type="checkbox"/> Elevation Analysis	[-] ☑ Features <ul style="list-style-type: none"><input checked="" type="checkbox"/> Edit<input type="checkbox"/> Edit with full control
[-] ☑ Open Data <ul style="list-style-type: none"><input type="checkbox"/> Manage Open Data site(s)		
Administrative Privileges		
[-] ☑ Members <ul style="list-style-type: none"><input type="checkbox"/> View all<input type="checkbox"/> Update<input type="checkbox"/> Delete<input type="checkbox"/> Invite<input type="checkbox"/> Disable<input type="checkbox"/> Change roles<input type="checkbox"/> Manage licenses	[-] ☑ Groups <ul style="list-style-type: none"><input type="checkbox"/> View all<input type="checkbox"/> Update<input type="checkbox"/> Delete<input type="checkbox"/> Reassign ownership<input type="checkbox"/> Assign members<input type="checkbox"/> Link to enterprise group<input type="checkbox"/> Create with update capabilities	[-] ☑ Content <ul style="list-style-type: none"><input type="checkbox"/> View all<input type="checkbox"/> Update<input type="checkbox"/> Delete<input type="checkbox"/> Reassign ownership<input type="checkbox"/> Manage categories
[-] ☑ ArcGIS Marketplace Subscriptions <ul style="list-style-type: none"><input type="checkbox"/> Request purchase information<input type="checkbox"/> Start trials		

ArcGIS Online Spatial Analysis

Release update

- Incremental release with each ArcGIS Online quarterly update
- New in 2016:
 - Join Features
 - Find Outliers
 - Better sharing experience with network analysis results
 - Performance improvements in Geoenrichment service
- New in 2017
 - Rerun analysis workflows
 - Find Centroid
 - Automatically generate bins for aggregation workflows
- New in 2018
 - Higher resolution data available for hydrology and elevation analysis services
 - Updated data for GeoEnrichment service



ArcGIS Online Analysis Workflow

The image features a dark teal background with a subtle, light-colored map grid pattern. In the center, the text "ArcGIS Online Analysis Workflow" is displayed in a bold, white, sans-serif font. The corners and sides of the image are decorated with abstract, overlapping geometric shapes in various shades of teal, blue, and orange, creating a modern, digital aesthetic.

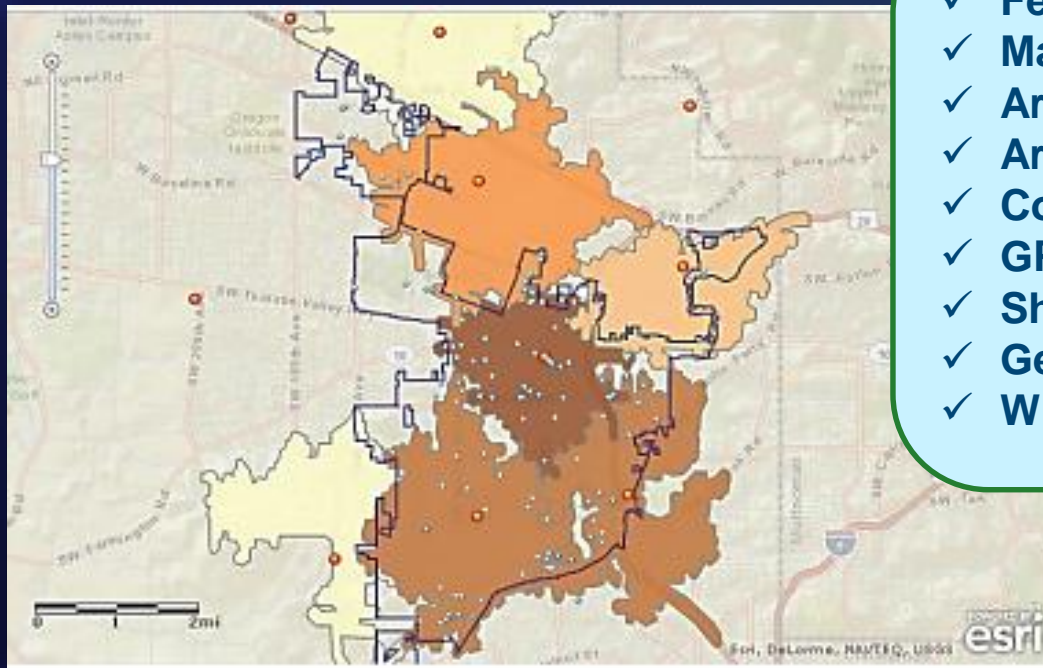
ArcGIS Online Analysis Workflow



Assemble data

Prepare data

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



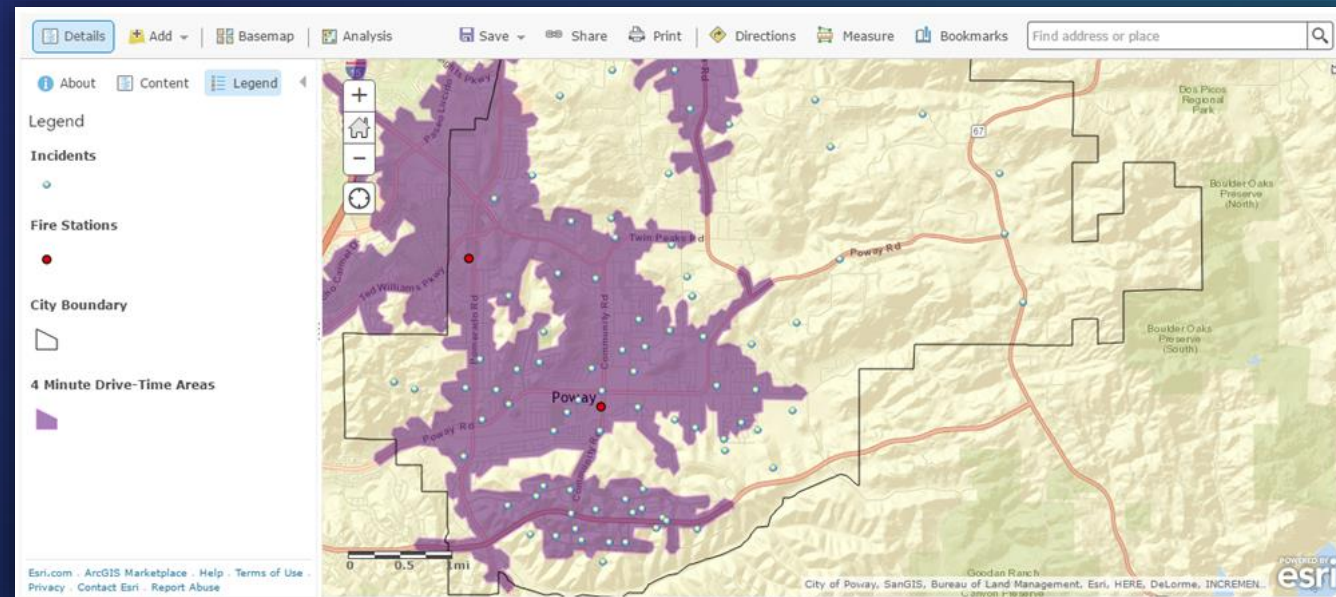
Supported data types

- ✓ 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

Add to
map

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

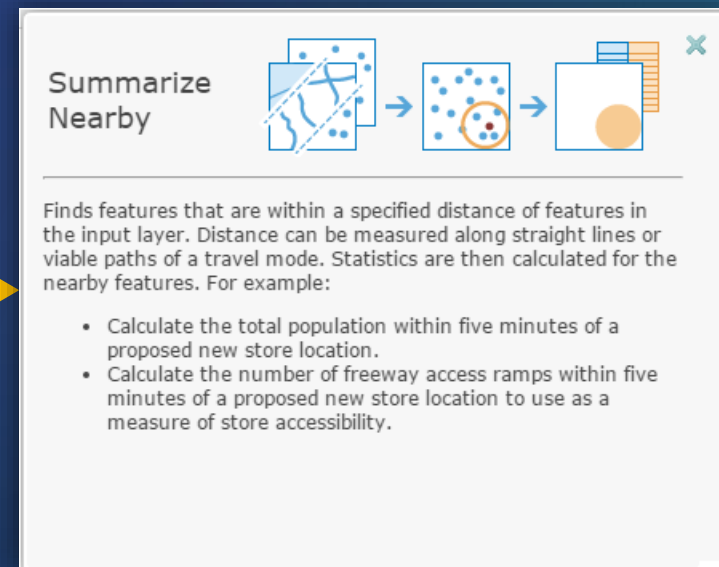
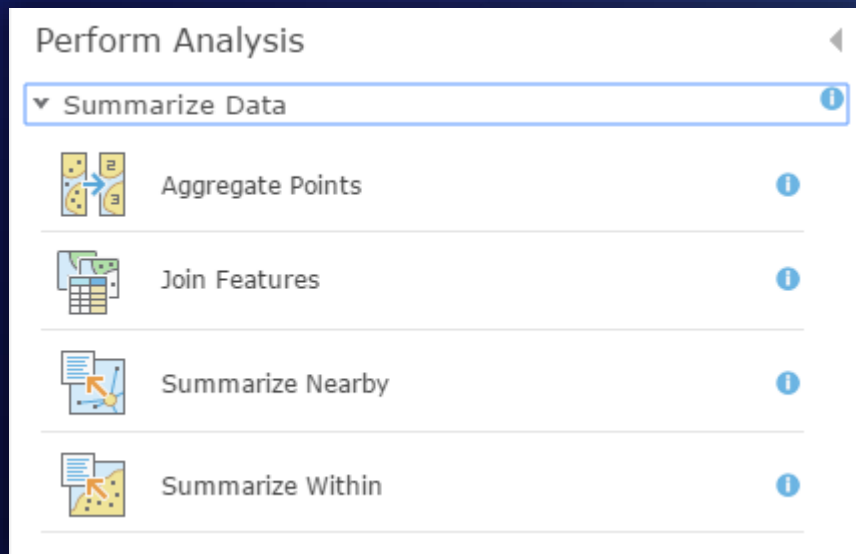
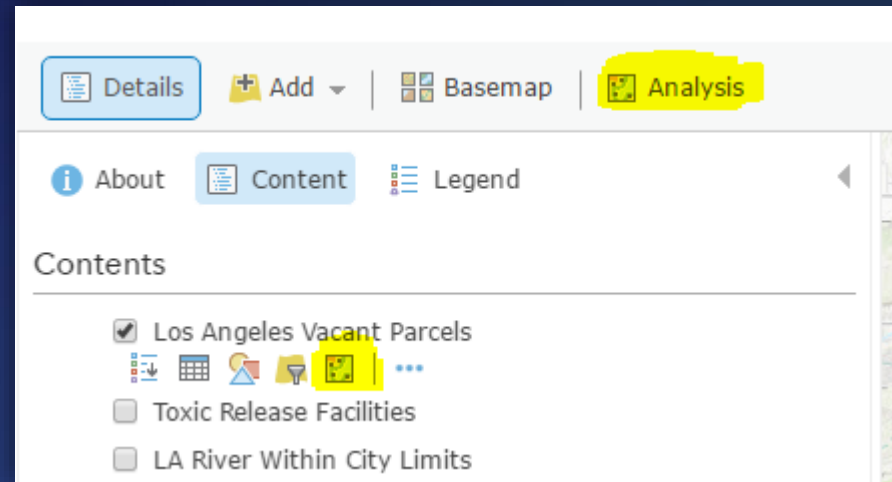


Living Atlas Analysis Layers and custom analysis layers do not need to be added to map

Analyze data

- Open Analysis tools
- Determine appropriate tool(s)

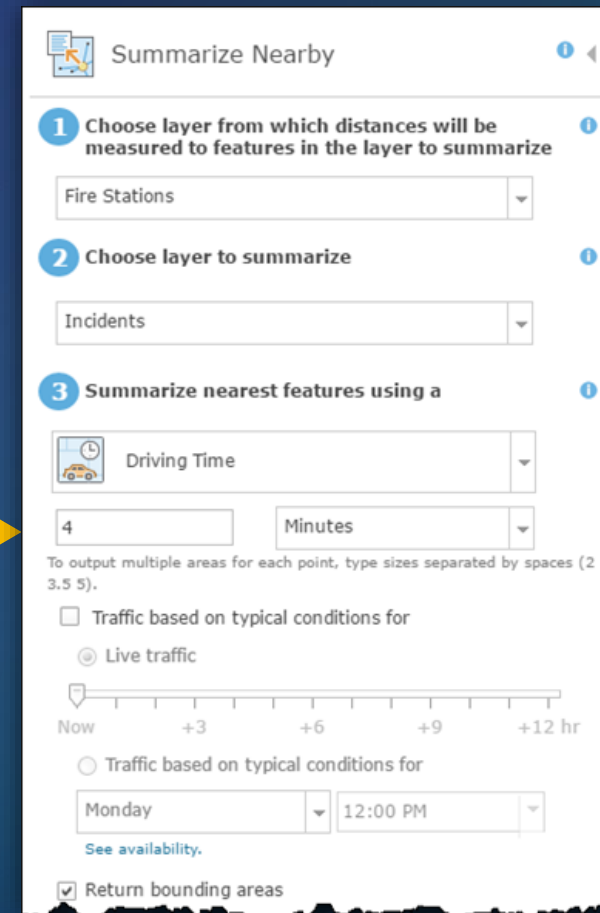
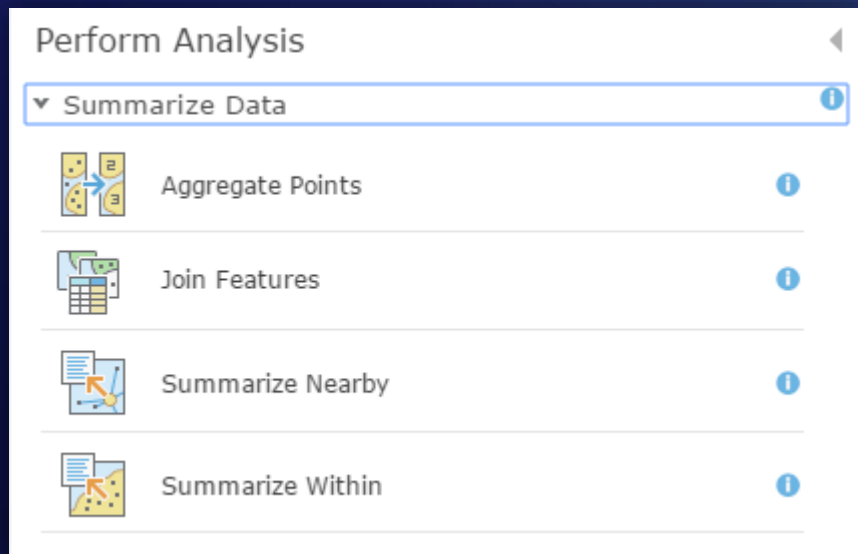
Perform analysis



Analyze data

Perform analysis

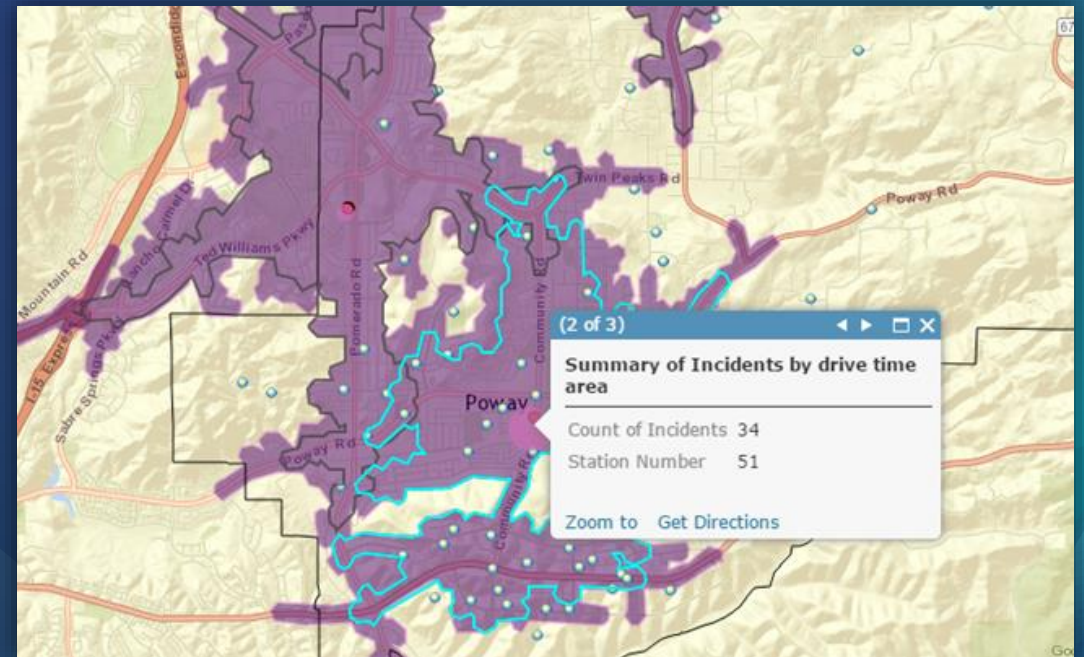
- Determine appropriate tool(s)
- Apply parameters



Use and review results

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

Review results

The screenshot displays the 'Analysis' tab in the ArcGIS Web AppBuilder interface. It features a table with three tool entries, each with a 'Name' column, a 'Settings' column (containing a wrench icon), and a 'Usage' column (containing a diagram and a description). The 'Aggregate Points' tool is selected, indicated by a checked checkbox and a teal highlight. Below the table, there are configuration options for the selected tool, including a text input for the display name and several checked checkboxes for widget options.


Name	Settings	Usage
<input checked="" type="checkbox"/> Aggregate Points		 Aggregate points into polygons where the points are located.
<input type="checkbox"/> Calculate Density		 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.
<input type="checkbox"/> Choose Best Facilities		 Choose Best Facilities

The tool display name :

- 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

Adding Analysis to Web Apps using Web AppBuilder for ArcGIS



Review results

**Create Buffers** ?

1 Choose layer containing features to buffer ?

State park ▼

2 Enter buffer size ?

 **Distance**  **Field**

Enter buffer size

3 Miles ▼

To create multiple buffers, enter distances separated by spaces (2 3 5).

+ Options ?


3 Result layer name ?

State ParkBuffer

Save result in UC2017 ▼

Use current map extent [Show credits](#)

Back **Run Analysis**

**Create Buffers** ?

Messages


Create Buffers submitted.

Executing

Succeeded.

Outputs

[State ParkBuffer](#)

[State ParkBuffer](#) 

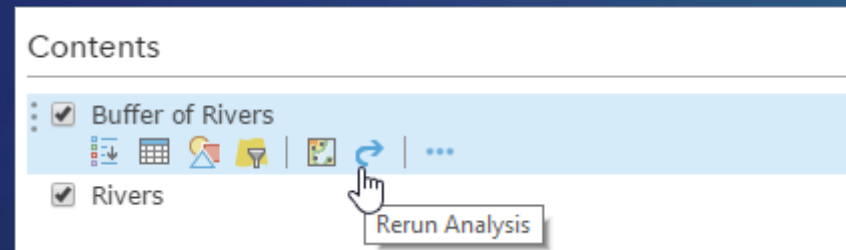
Note: Feature and table outputs are added in the map as operational layers.

Back **Home**

Rerun analysis

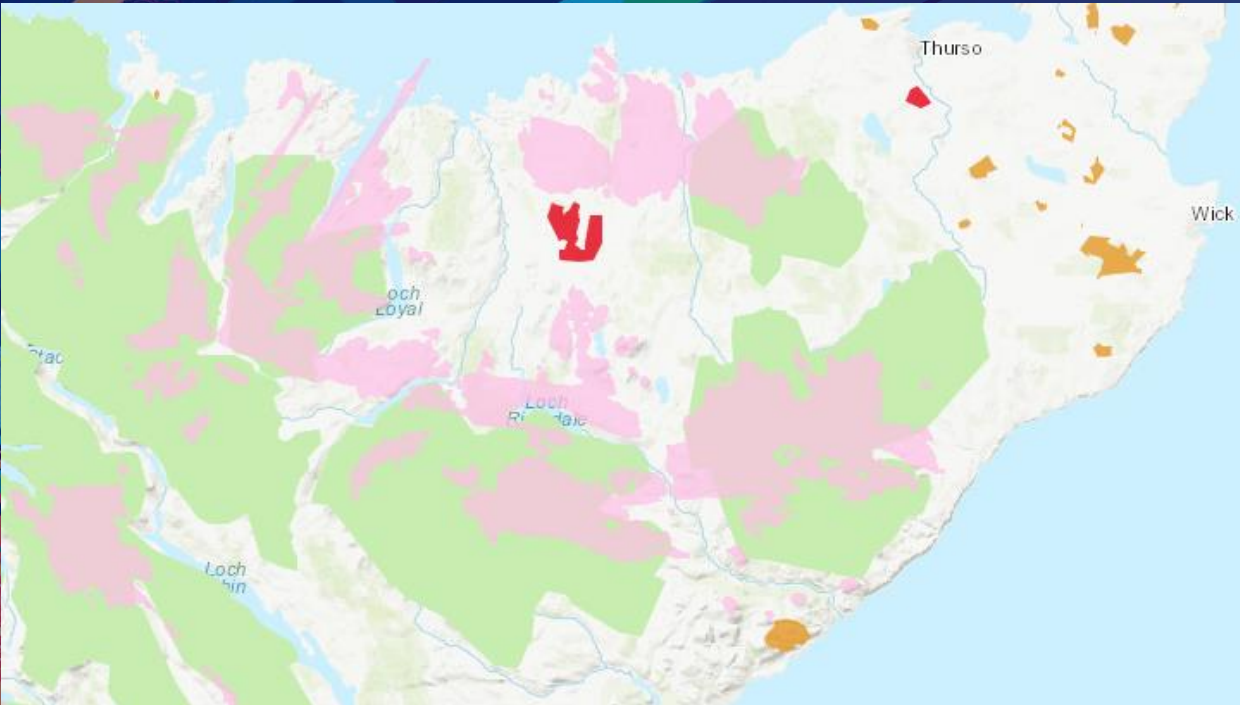
Rerun
analysis

- Analysis can be rerun 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



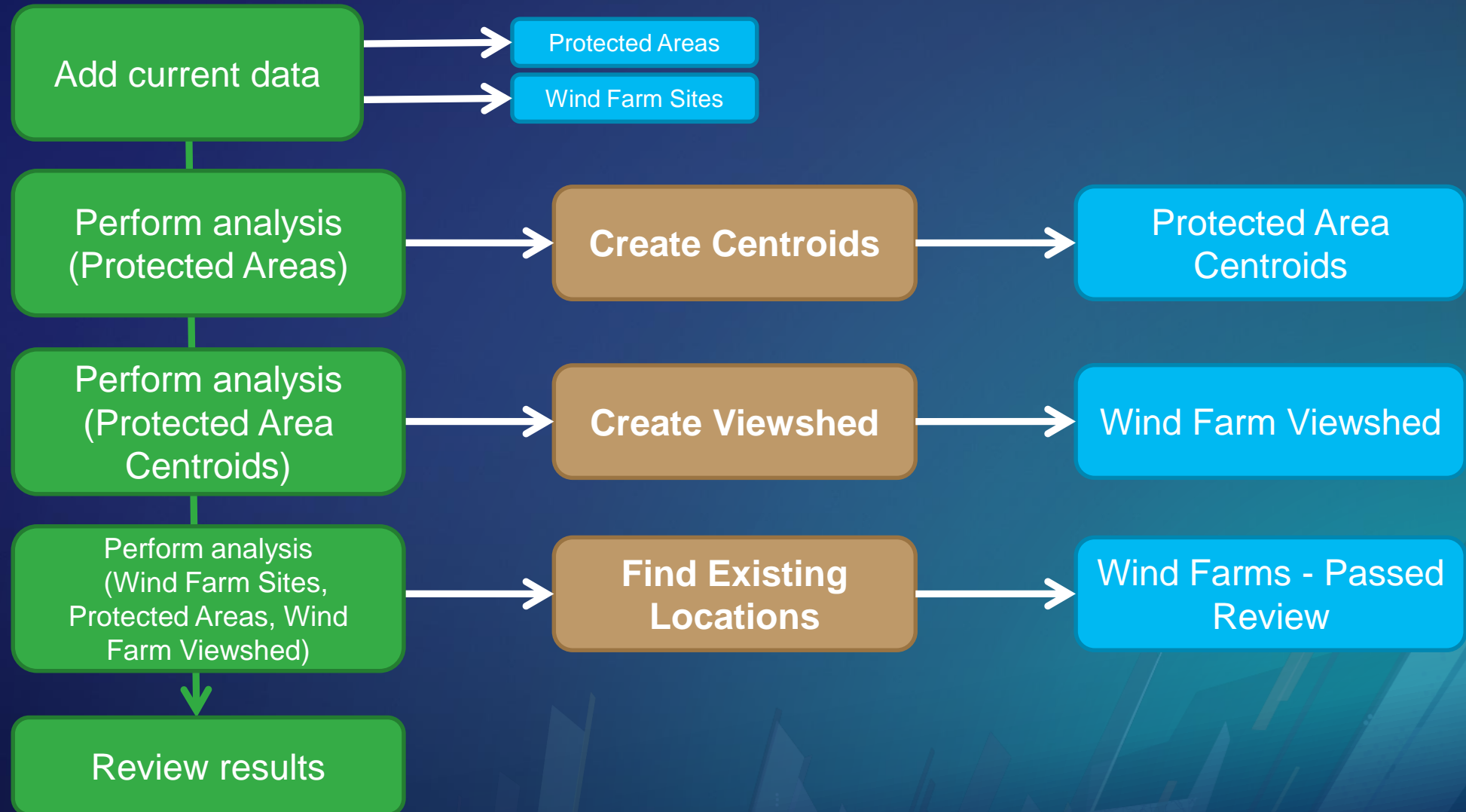
Demos: Using Online Analysis to Solve Problems

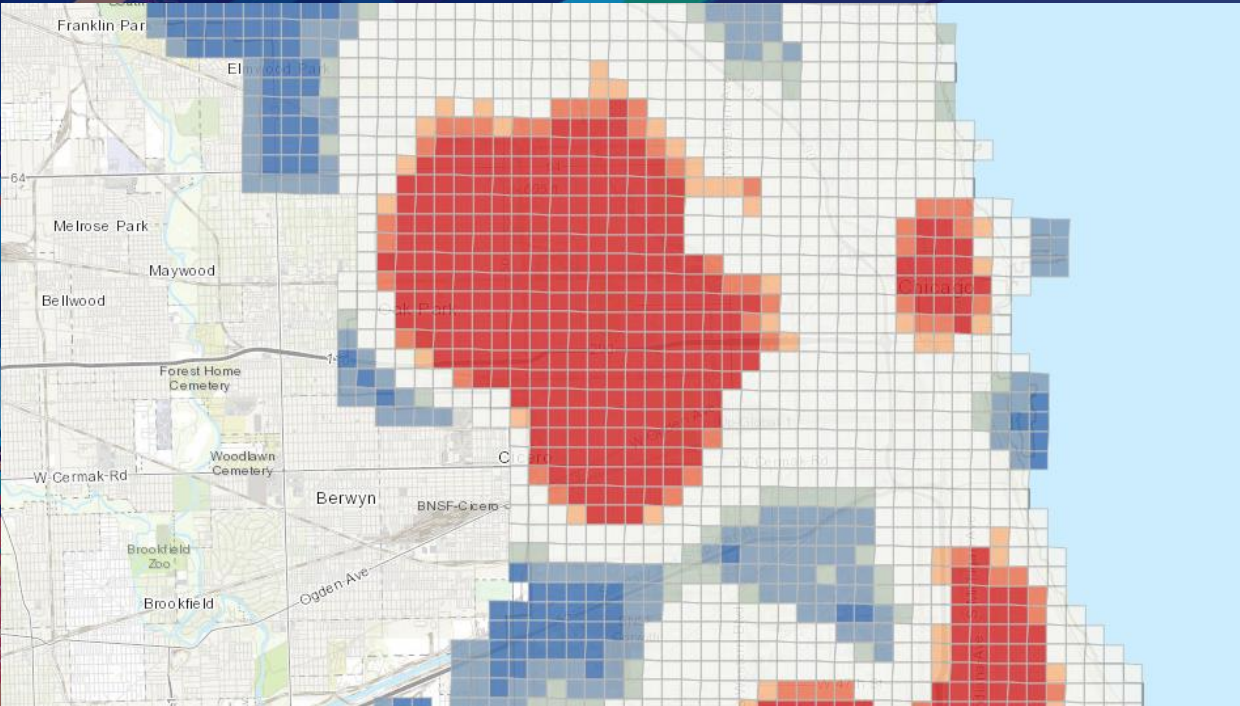
The image features a dark teal background with a white title. On the left, there are abstract, overlapping lines in shades of teal and red. On the right, there are more complex geometric shapes, including a red grid pattern and several overlapping bars in orange, yellow, and green, all set against a lighter teal backdrop.



Environmental assessment and suitability analysis

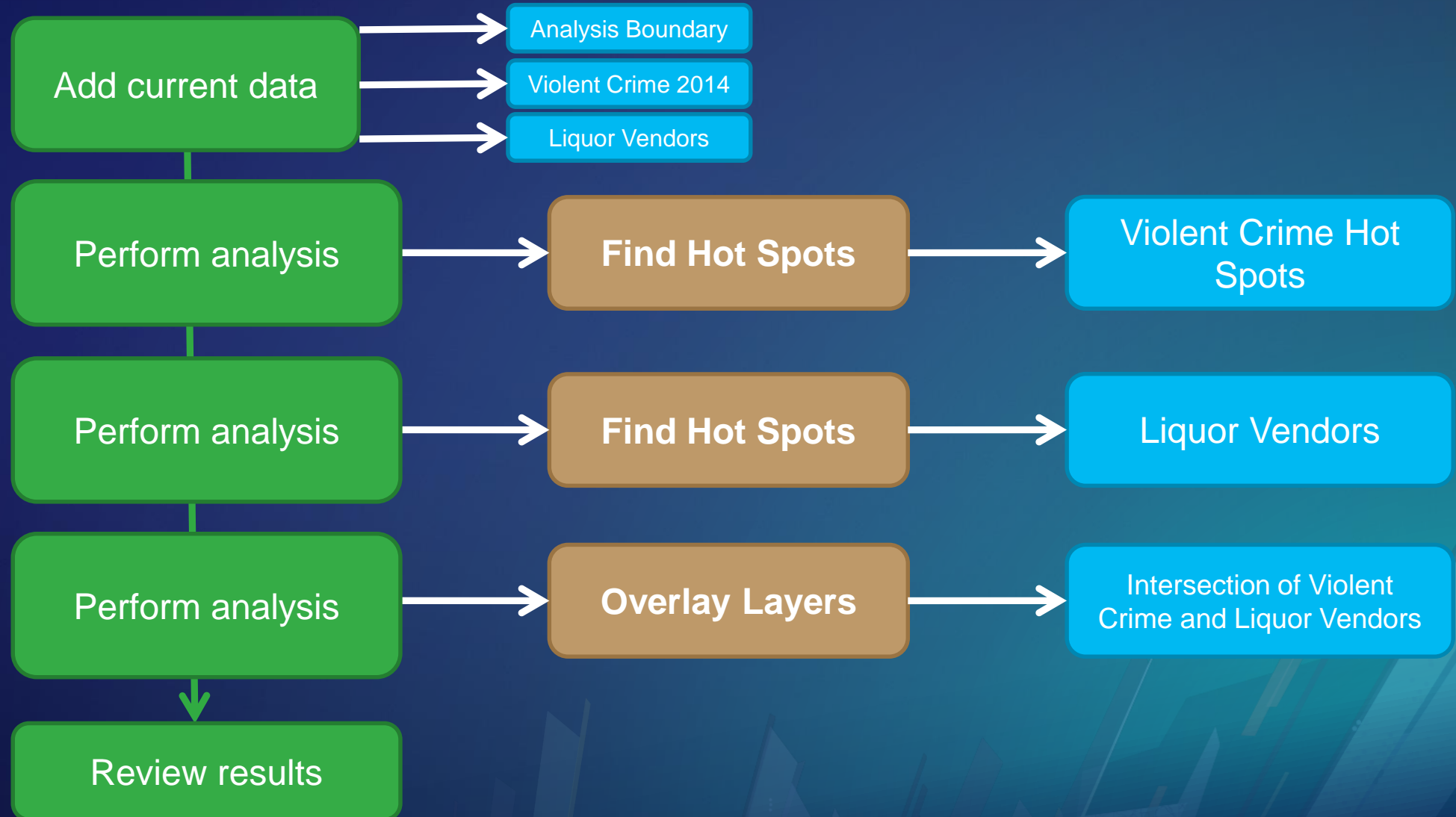
Demonstration review

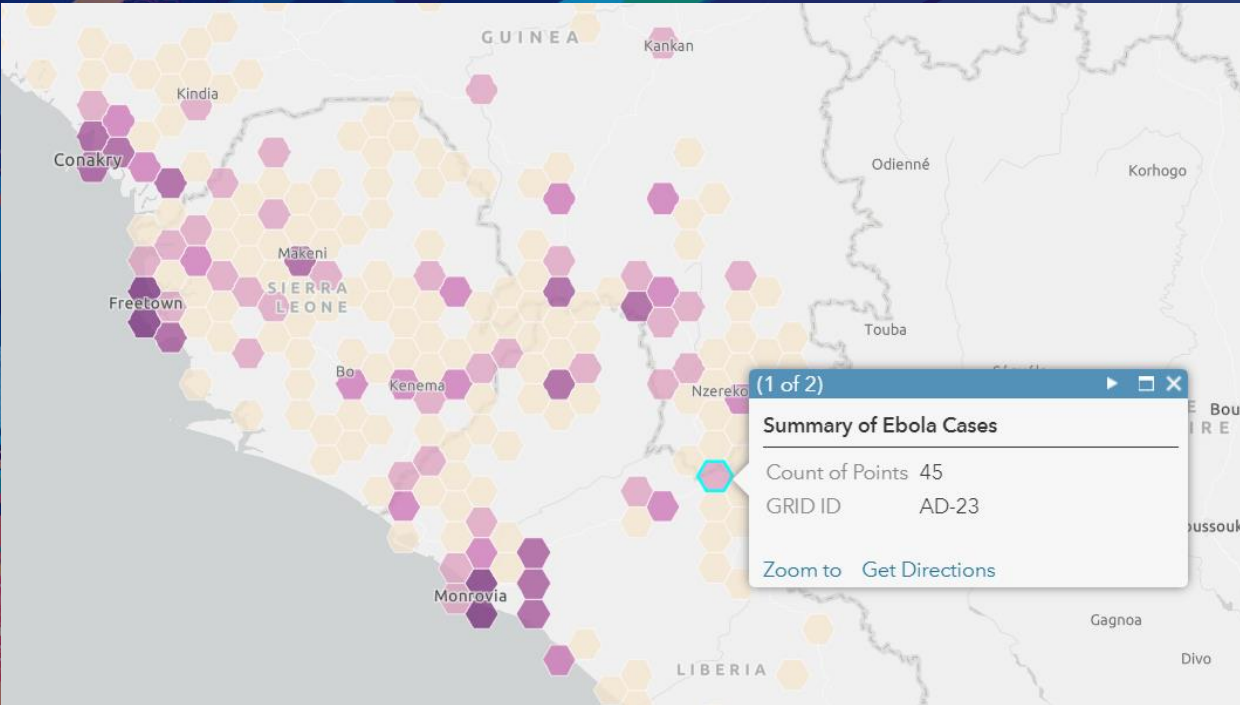




Analyzing violent crime

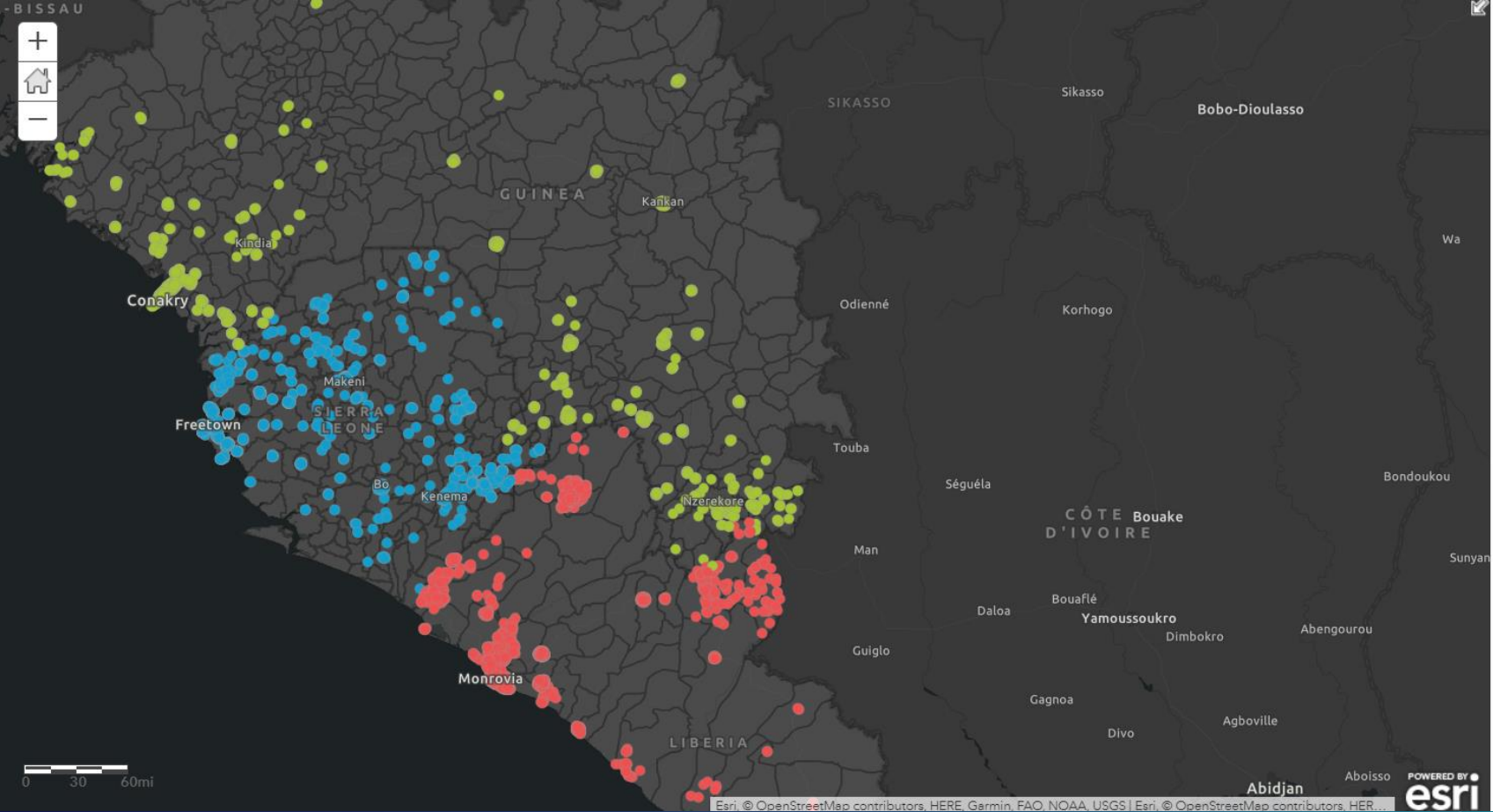
Demonstration review





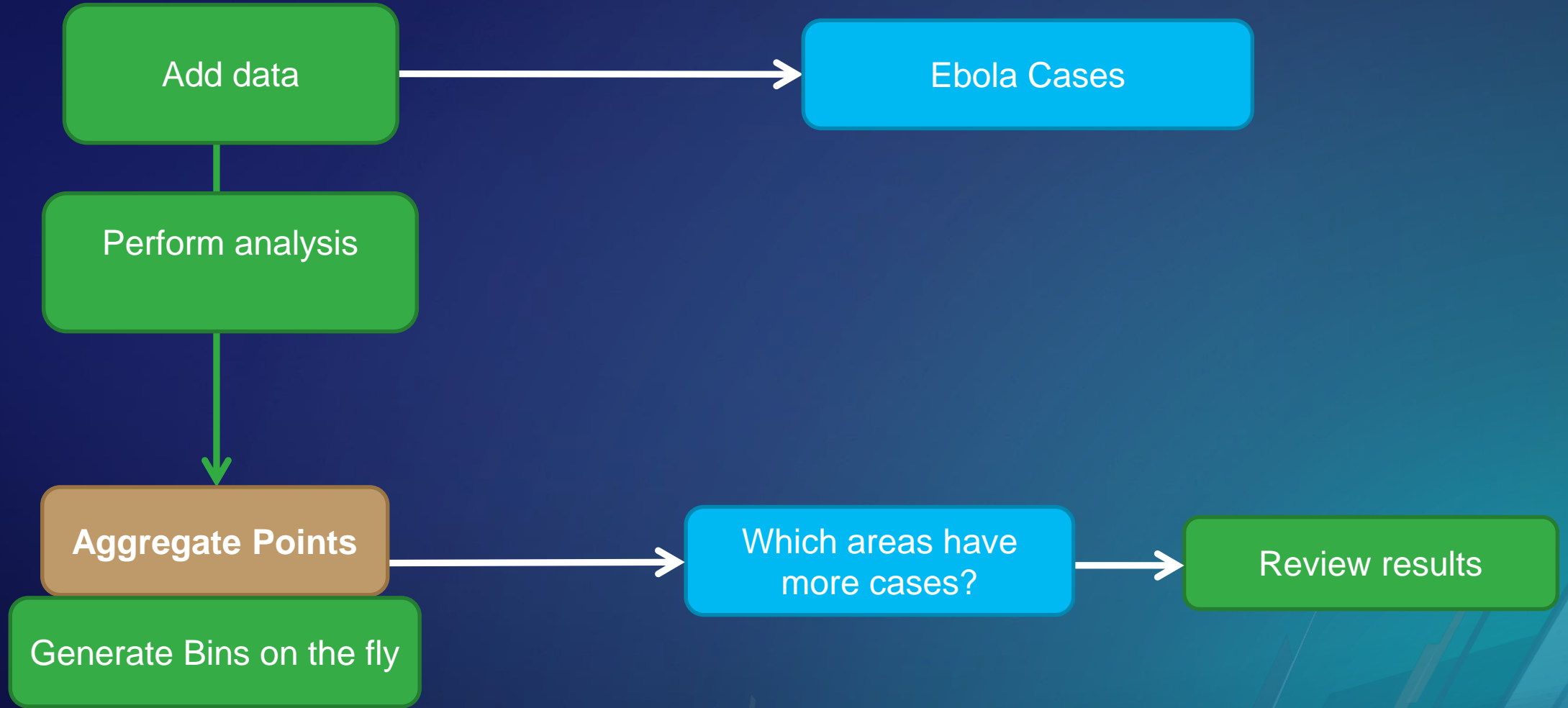
Summarize data using custom generated bins

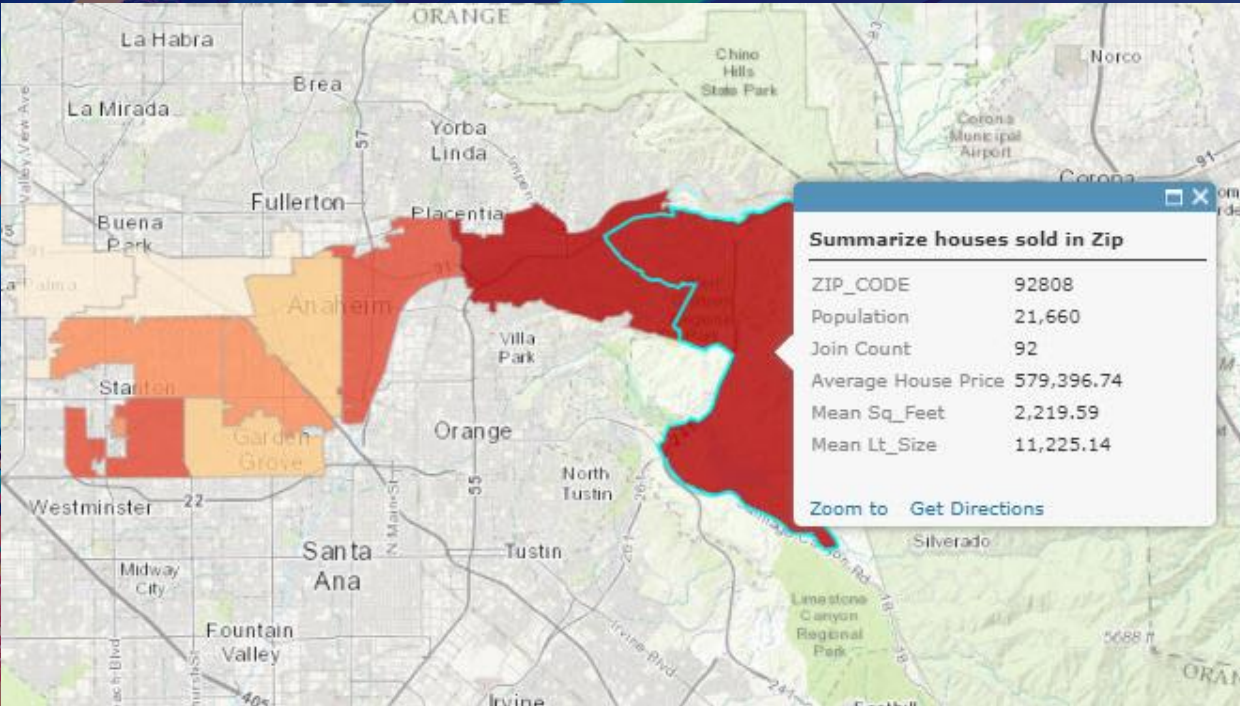
Demo Scenario



Aggregate Ebola Cases in West Africa

Demonstration review





Summarize house sales per zip code

Demo Scenario

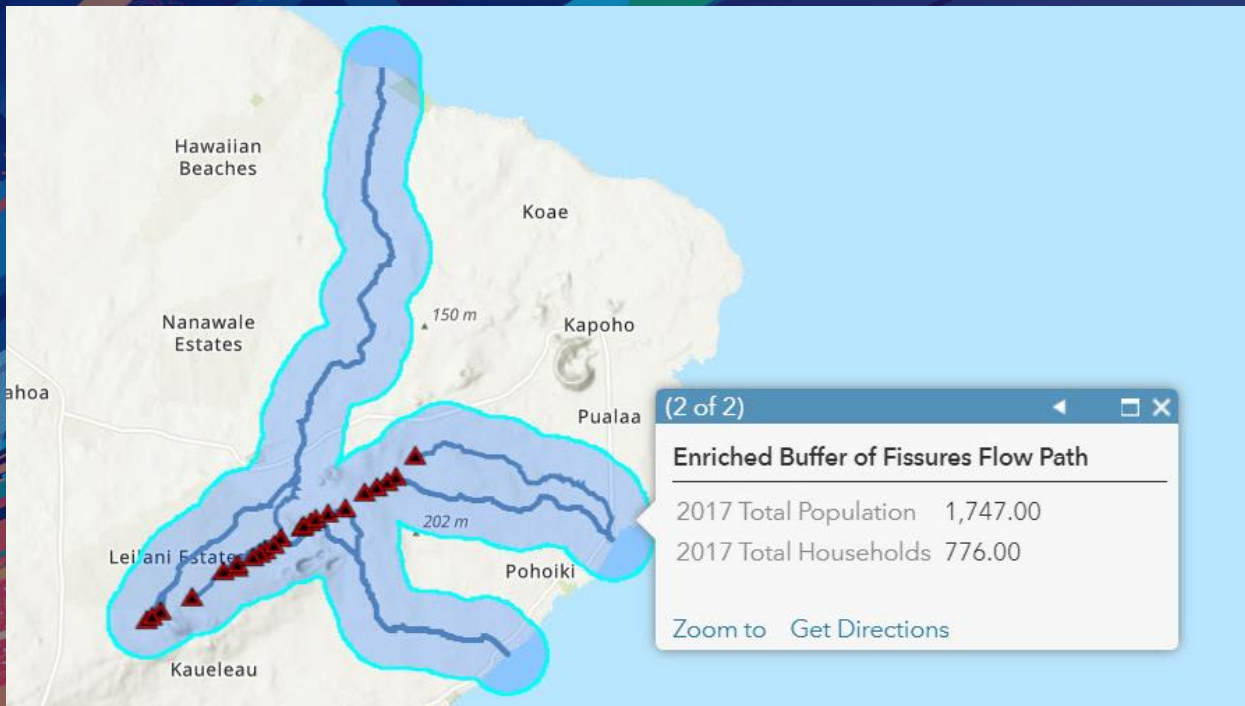
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Sq.Feet	BR	BA	Date	Amount	Yr.Built	Lt Size	Acres	Pool	APN	APN-TR	City	ZIP_CODE	STATE
2	1240	3	2	1/12/2010 0:00	55300	1975	5450	0.13	0	351-061-4	35	Anaheim	92807	CA
3	1125	3	1	1/12/2010 0:00	80000	1955	7992	0.18	0	128-531-3	12	Anaheim	92804	CA
4	966	2	2	1/22/2010 0:00	101000	1964	5942	0	0	897-090-0	89	Anaheim	92804	CA
5	966	2	2	1/27/2010 0:00	117000	1964	4781	0	0	897-091-8	89	Anaheim	92804	CA
6	1272	2	2	1/25/2010 0:00	165000	1964	5193	0	0	897-090-6	89	Anaheim	92804	CA
7	1072	2	1	1/11/2010 0:00	223000	1972	1120	0.03	0	127-012-0	12	Anaheim	92804	CA
8	1120	3	1	1/13/2010 0:00	230000	1953	6061	0.14	0	083-335-1	8	Anaheim	92806	CA
9	944	1	1	1/14/2010 0:00	240000	1953	6480	0.15	0	037-201-3	3	Anaheim	92805	CA
10	1149	3	1	1/29/2010 0:00	245000	1954	6018	0.14	0	083-342-1	8	Anaheim	92806	CA
11	880	3	1	1/29/2010 0:00	245000	1949	7200	0.17	0	071-162-1	7	Anaheim	92801	CA
12	1536	4	2	1/22/2010 0:00	250000	1956	8505	0.2	0	128-313-2	12	Anaheim	92804	CA
13	1930	4	2	1/25/2010 0:00	250000	1957	6183	0.14	0	070-522-0	7	Anaheim	92801	CA
14	1012	2	1	1/27/2010 0:00	260000	1972	1390	0.03	0	363-061-2	36	Anaheim	92807	CA
15	1578	4	2	1/12/2010 0:00	265000	1955	6161	0.14	0	071-242-0	7	Anaheim	92801	CA
16	944	3	1	1/15/2010 0:00	265000	1955	7200	0.17	0	131-182-1	13	Anaheim	92804	CA
17	943	2	1	1/28/2010 0:00	270000	1974	2105	0.05	0	268-191-0	26	Anaheim	92806	CA

Determine what is the average sales price per zip code in the area?

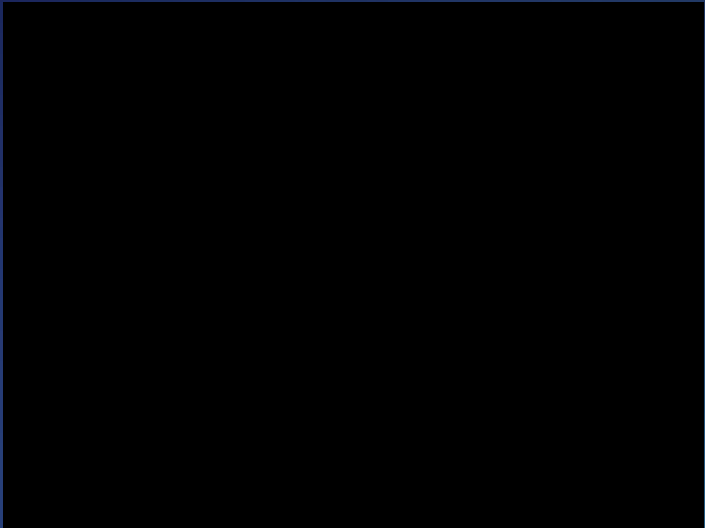
Demonstration review



Predict Lava Flow

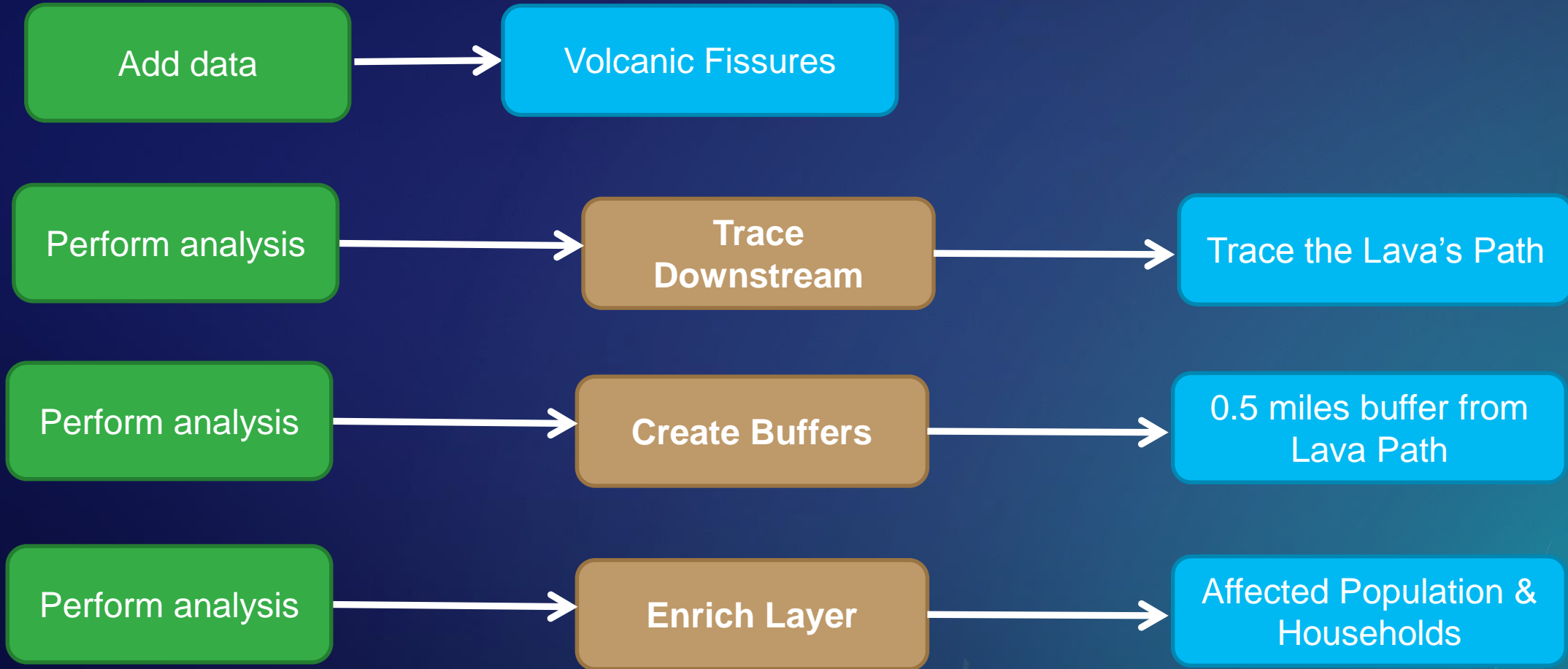


Demo Scenario



Which way the lava coming from the fissures will flow?
How many people will be impacted?

Demonstration review





Wrap up

Summary

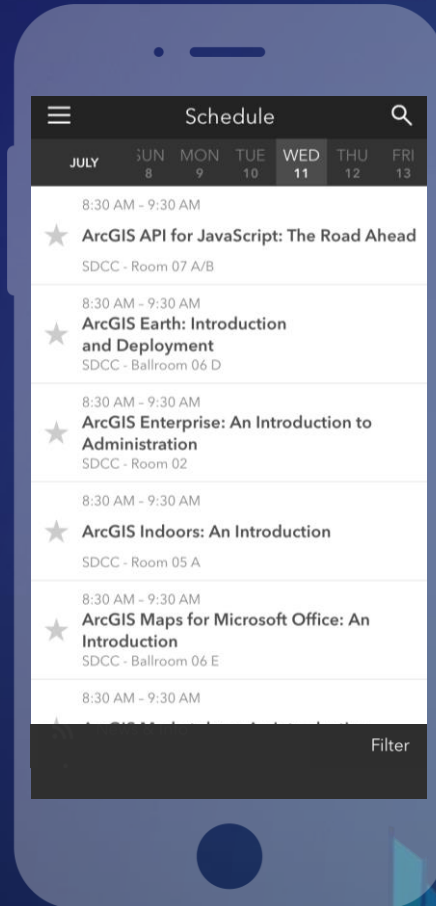
- **Spatial analysis adds valuable insight by providing hosted tools that work with your data in your ArcGIS Online organization**
- **Performing spatial analysis online is easy and intuitive**
- **Use ArcGIS Online spatial analysis to discover geographic relationships, patterns, and trends**

Please Take Our Survey on the App

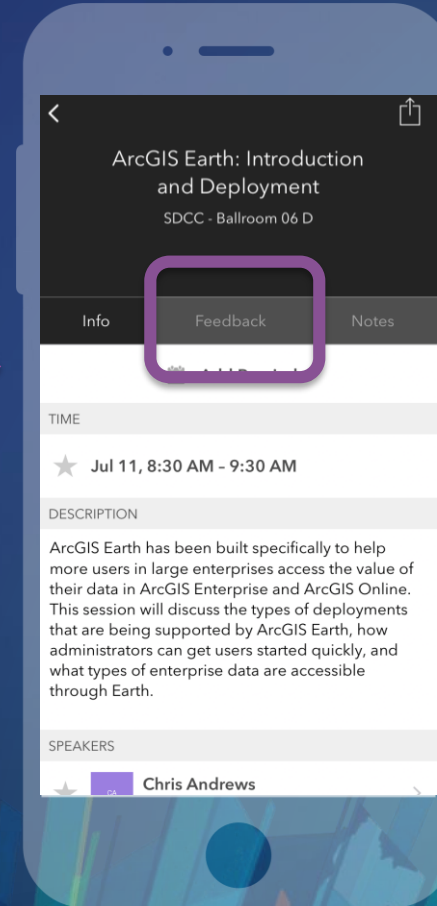
Download the Esri Events app and find your event



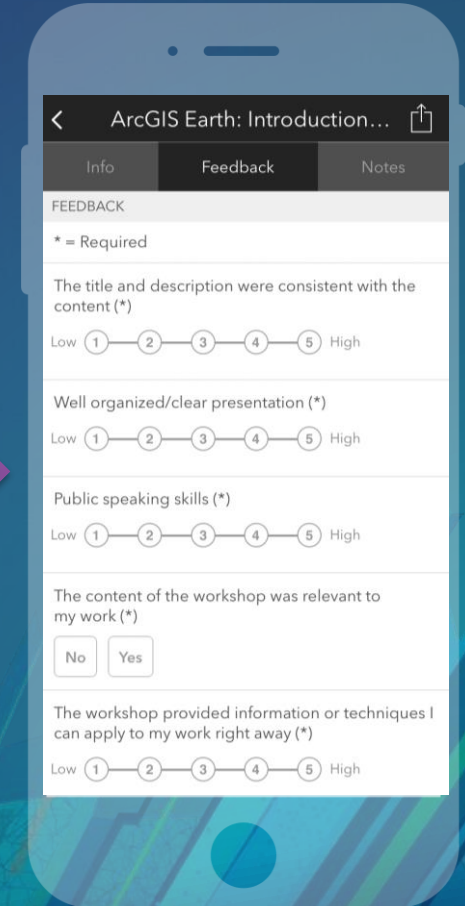
Select the session you attended



Scroll down to find the feedback section



Complete answers and select "Submit"



See Us Here

WORKSHOP	LOCATION	TIME FRAME
<ul style="list-style-type: none"><li data-bbox="191 385 305 428">• Title	<ul style="list-style-type: none"><li data-bbox="930 385 1082 428">• Where	<ul style="list-style-type: none"><li data-bbox="1668 385 1936 428">• 12:00 – 1:00



esri

**THE
SCIENCE
OF
WHERE**