



Insights for ArcGIS

An Introduction

Gustavo Castro

GOLD

Cityworks[®]

SILVER

TRUE NORTH
GEOGRAPHIC TECHNOLOGIES



THANK YOU TO
OUR SPONSORS

Agenda



Insights for ArcGIS



How to Get Insights



Insights as a Capability
within ArcGIS

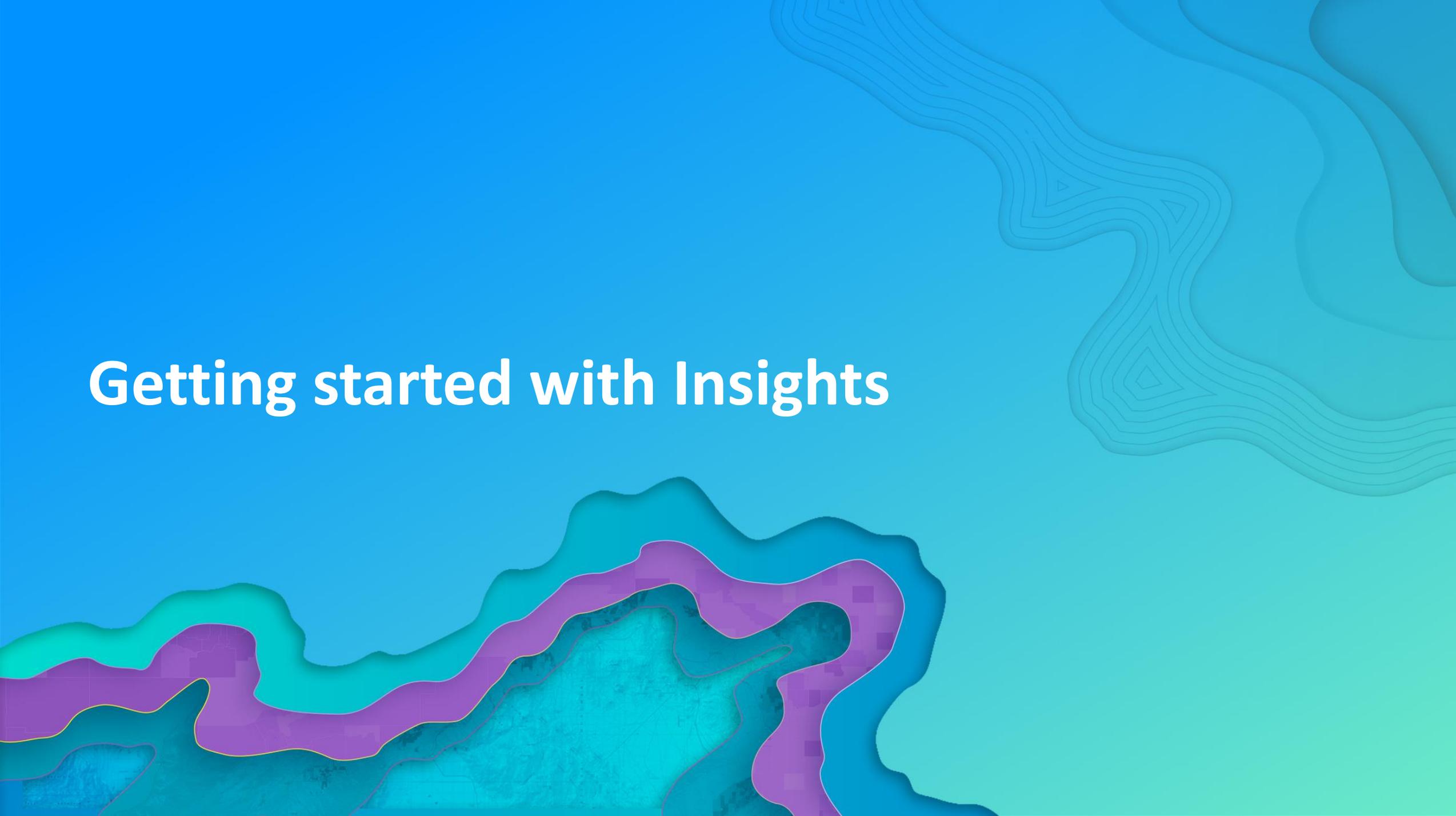


“*Data* is important...
However, not as important as the *answers* it
provides or the *stories* that it tells.”

Art Haddad, CTO, Location Analytics

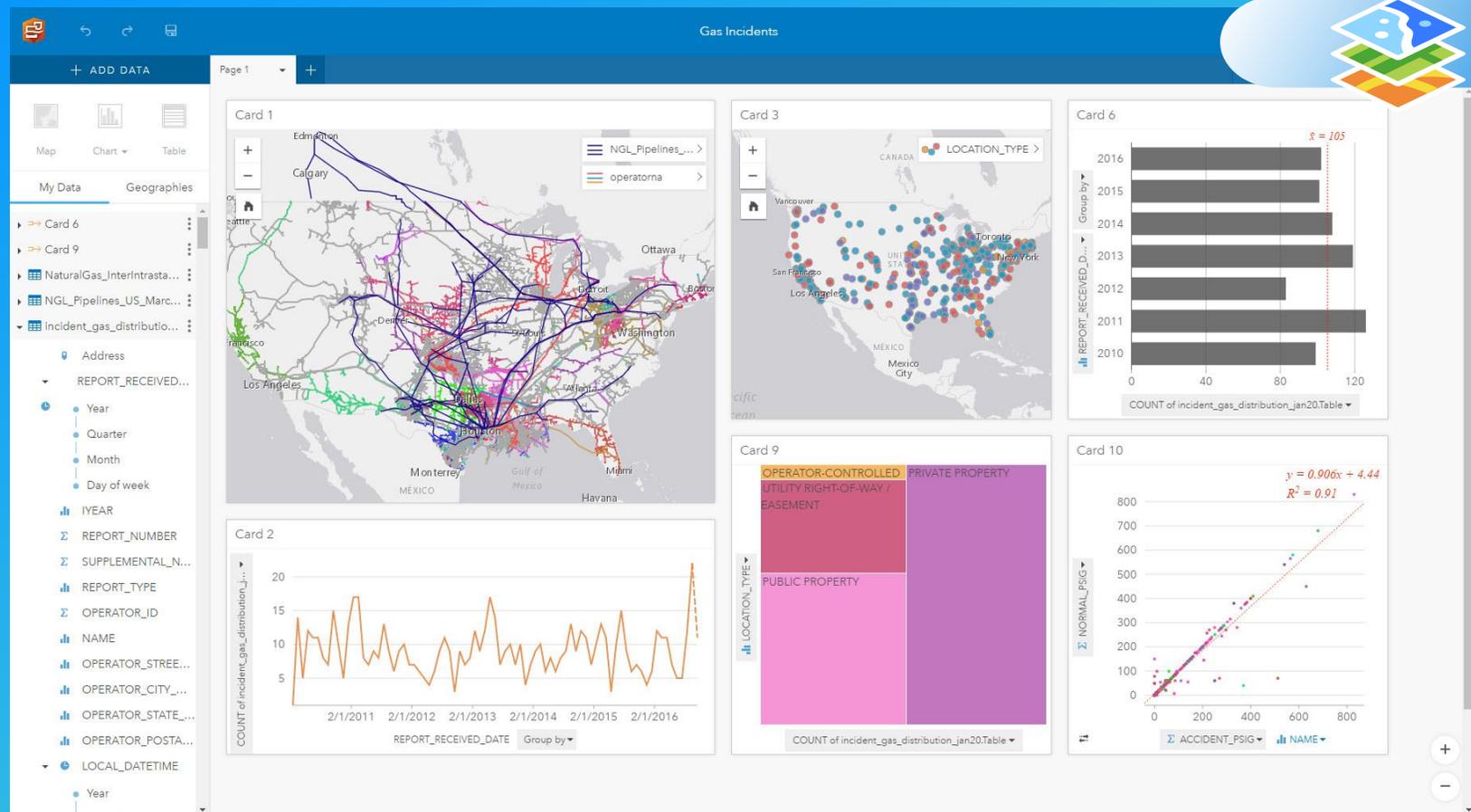


Getting started with Insights

The background features a gradient from dark blue on the left to light teal on the right. In the bottom left, there are layered, wavy shapes in shades of purple and teal. In the top right, there is a faint, light-colored topographic map pattern with concentric contour lines.

Explore a new world in your data

Work with maps, charts, and tables.



Insights page

Quickly Increase Decision Confidence with Insights for ArcGIS



ArcGIS – Common Patterns of Use

Mapping & Visualization



Understand locations and relationships with maps and visual representations

Data Management



Collect, organize, and maintain accurate locations and details about assets and resources

Field Mobility



Manage and enable a mobile workforce to collect and access information in the field

Monitoring



Track, manage, and monitor assets and resources in real-time

Analytics



Discover, quantify, and predict trends and patterns to improve outcomes

Design & Planning



Evaluate alternative solutions and create optimal designs

Decision Support



Gain situational awareness, and enable information-driven decision making

Constituent Engagement



Communicate and collaborate with citizens and external communities of interest

Sharing & Collaboration



Empower everyone to easily discover, use, make, and share geographic information



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Access Data Anywhere



Follow Your Workflow



Analytic Workflows, With Deeper Insight

Statistical Analysis

- Descriptive stats
- Link analysis
- Regression

Spatial Analysis

- How is it distributed?
- How is it related?
- What's nearby?
- How has it changed?

Visualization

- Interactive data views
- Charts, graphs, tables, and maps
- Dynamic selection & cross filtering
- Context of the largest digital atlas in world

GeoEnablement

- Geocode address
- Convert X,Y
- Join to boundaries
- Join to demographic variables

Record & Repeat Analysis

- Share model to analysts
- Document best practices
- Re-run with new data

Data Preparation

- Format fields
- Calculate new fields

ArcGIS Insights

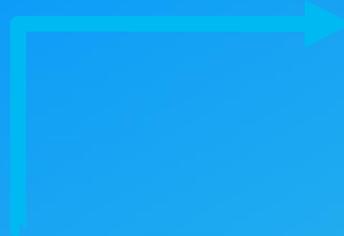
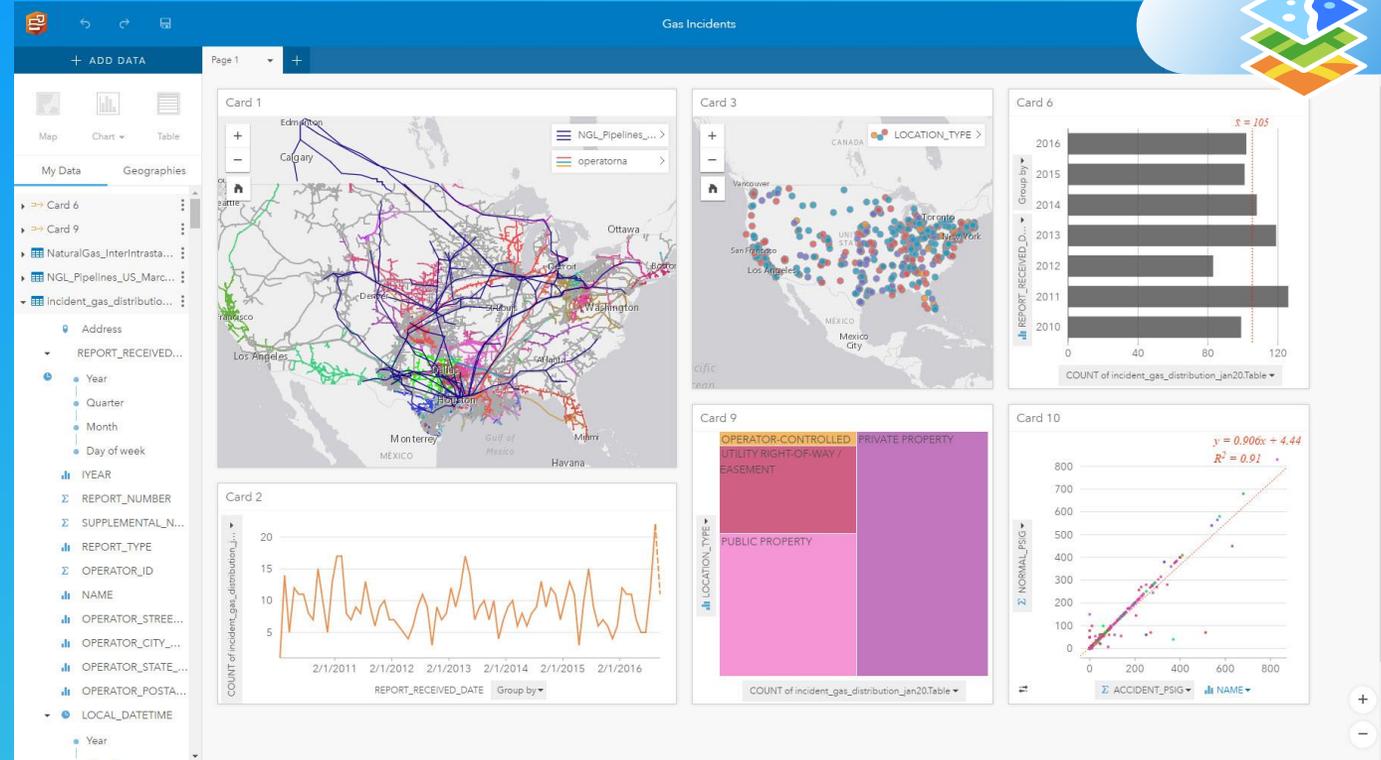


Empowering the Analyst and Scientist



Insights for ArcGIS

Multiple data sources



Insights page

Visualize and Analyze Spatial and Tabular Data



Insights for ArcGIS

Find the data you need for your analysis and share your results



Spatial and Tabular Data



Insights for ArcGIS
(ArcGIS Online or ArcGIS Enterprise)

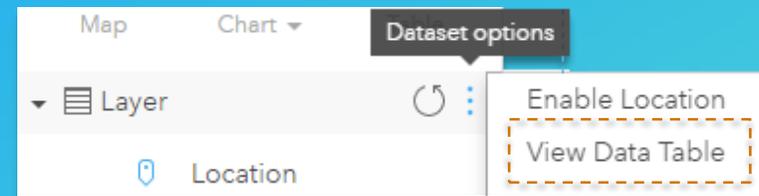


ArcGIS

Data Table

Attribute table

Access, add and calculate fields



Create Relationships

Join attributes from two or more datasets based on common fields.

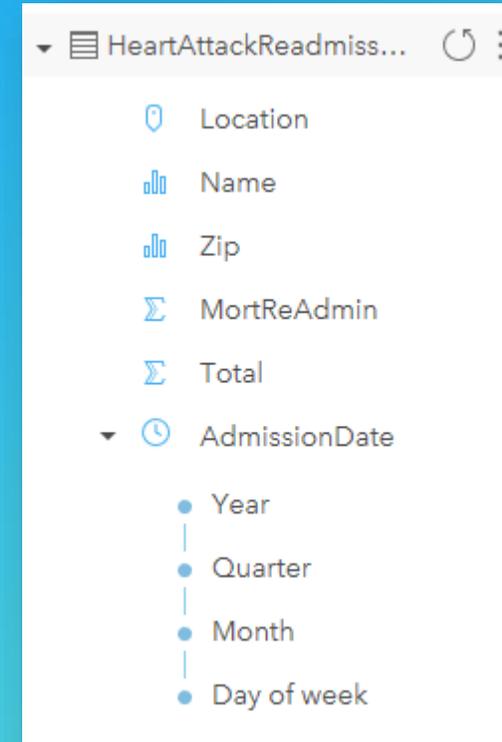
The screenshot displays the 'Create Relationships' dialog box in a GIS application. On the left, under 'My Data', two datasets are listed: 'well_production' and 'well_attributes', both with checkmarks. The main area shows two dataset thumbnails: 'well_production' and 'well_attributes'. An 'API' field is selected in both. An 'Edit Relationship' dialog is open, showing four relationship types: 'Intersect', 'All', 'Left', and 'Right'. The 'Intersect' type is selected. Below, the 'Choose Fields' section shows two dropdown menus, both containing 'API', connected by a line. A plus sign button is below the dropdowns. At the bottom right, 'Cancel' and 'Finish' buttons are visible, with 'Finish' being the active button.



Working with Data – Intelligent defaults

Fields, or attributes are defined to a role

Insights works directly against the fields

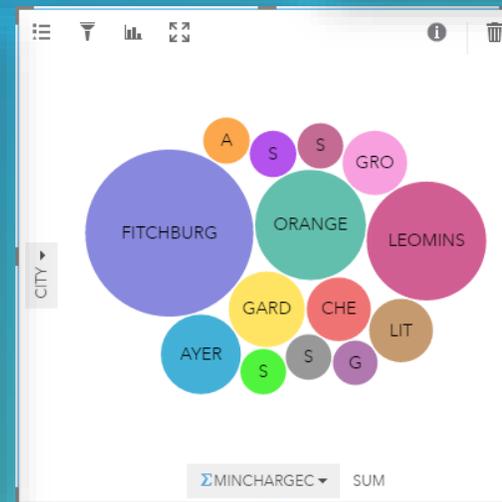
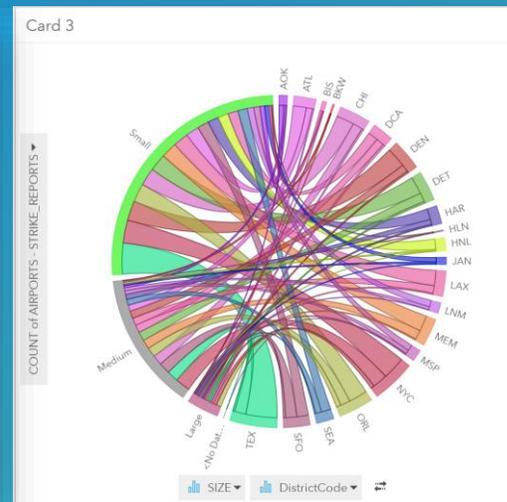
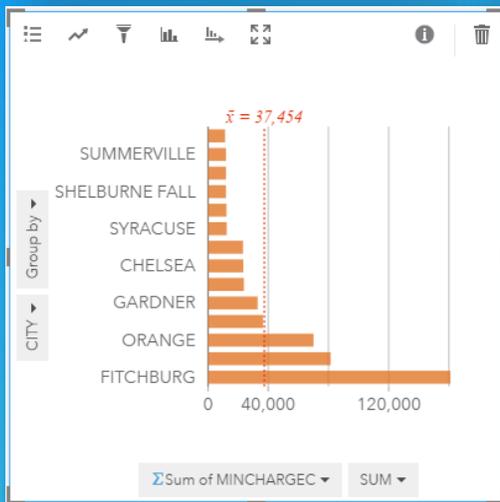
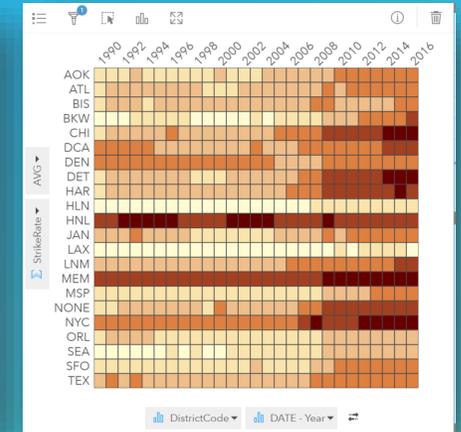
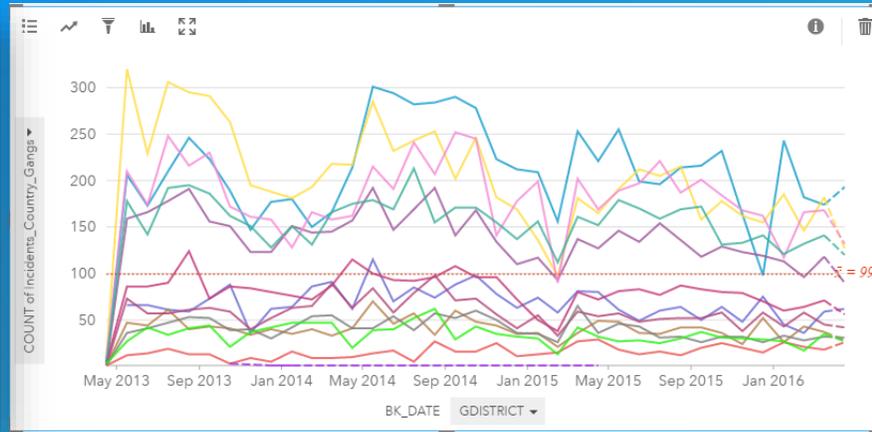
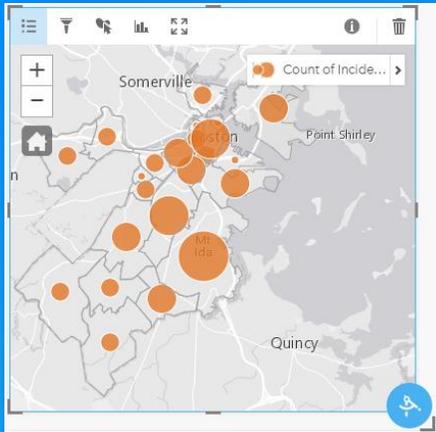


...roles help define actions that can be taken in Insights for ArcGIS



Results of Analytic Operations are expressed in Cards

Visualize data and results as maps, charts, and tables.



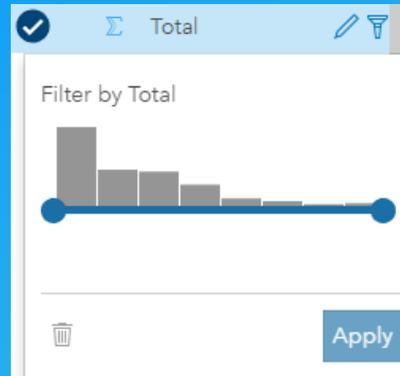
city	population	SUM
PHILADELPHIA	6,450	
LOS ANGELES	4,952	
ST. LOUIS	4,072	
LOUISVILLE	4,049	
ATLANTA	3,742	
SACRAMENTO	3,609	
BOSTON	3,539	
SAN FRANCISCO	3,480	
PITTSBURGH	3,159	
WASHINGTON	3,084	
MILWAUKEE	2,651	
TOTAL	6,447	503,115





Selections and Filters

- Attribute filters
 - Data pane versus card
 - Remember date breakdowns
- Spatial filters
 - Drag and drop polygons
 - Drawing
- Attribute selection
 - Use the interactivity
 - Legends
 - Cards e.g. maps, charts, tables
- Spatial selection
 - Drag selection to new map card

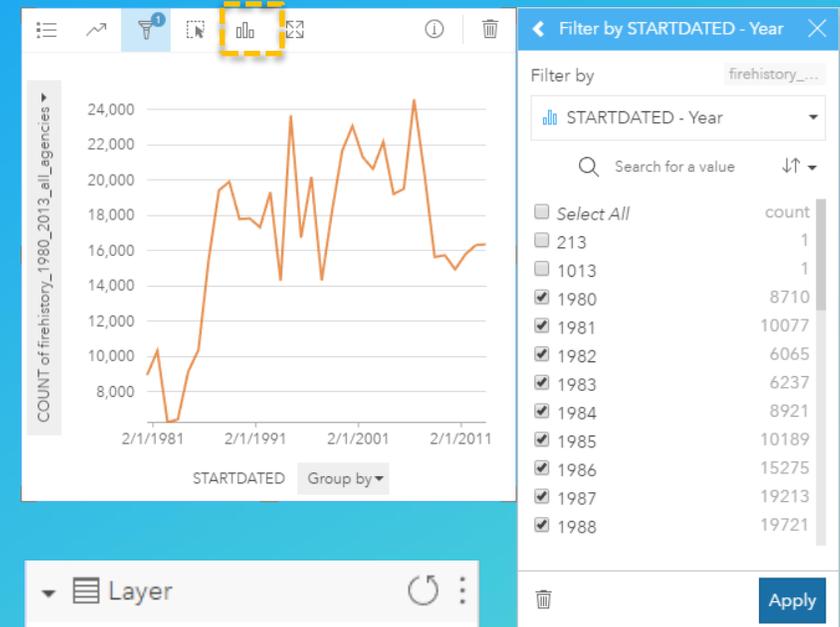


Filter by City

Search for a value

	count
<input checked="" type="checkbox"/> Select All	
<input checked="" type="checkbox"/> ALAMEDA	1
<input checked="" type="checkbox"/> ALHAMBRA	1
<input checked="" type="checkbox"/> ANAHEIM	3
<input checked="" type="checkbox"/> ANTIOCH	1
<input checked="" type="checkbox"/> APPLE VALLEY	1
<input checked="" type="checkbox"/> ARCADIA	1
<input checked="" type="checkbox"/> ARROYO GRANDE	1
<input checked="" type="checkbox"/> AUBURN	1
<input checked="" type="checkbox"/> BAKERSFIELD	3
<input checked="" type="checkbox"/> BANNING	1
<input checked="" type="checkbox"/> BERKELEY	1

Apply

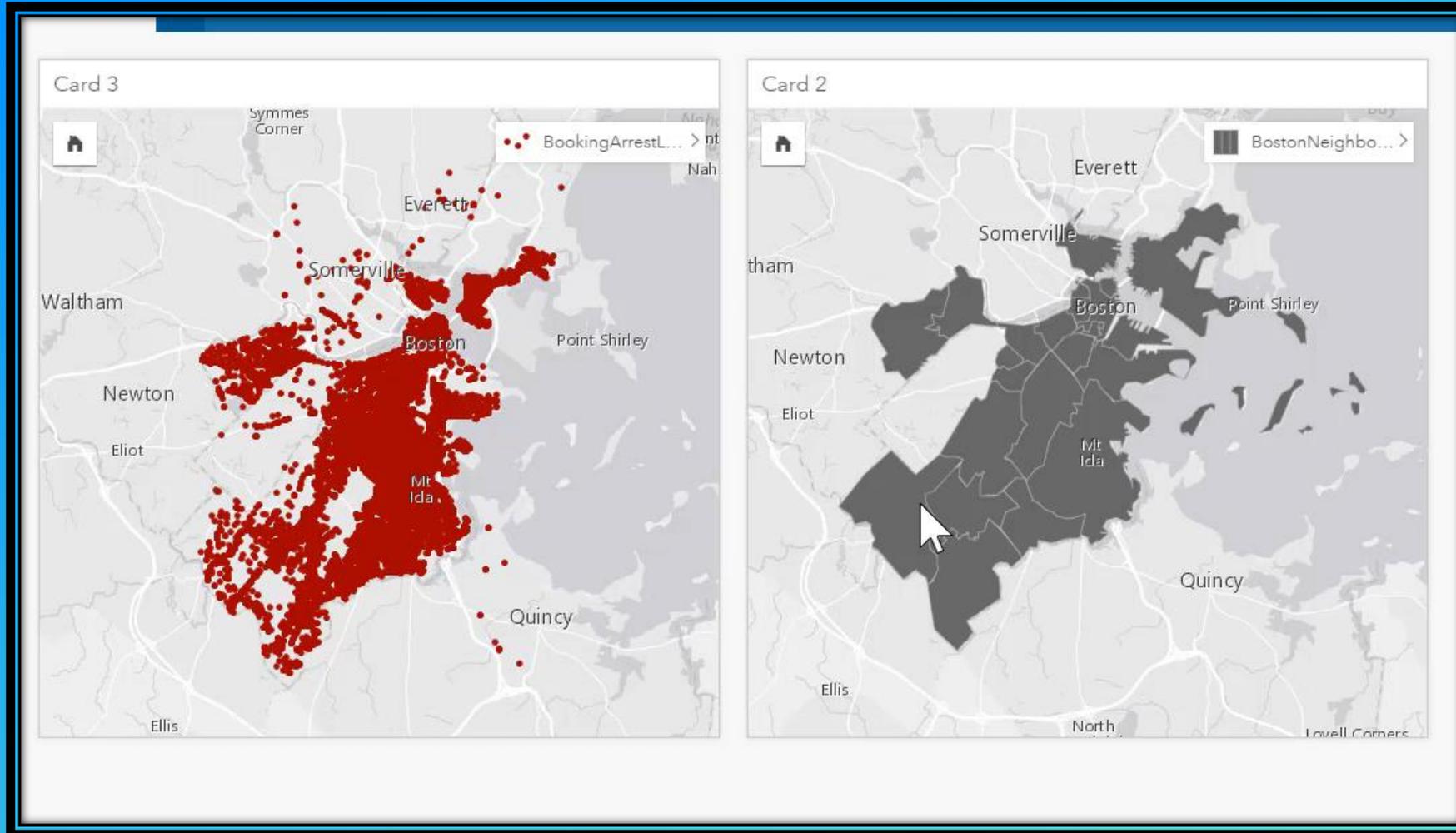


Layer

- Location
- GEOID
- Id
- FIPS
- Households

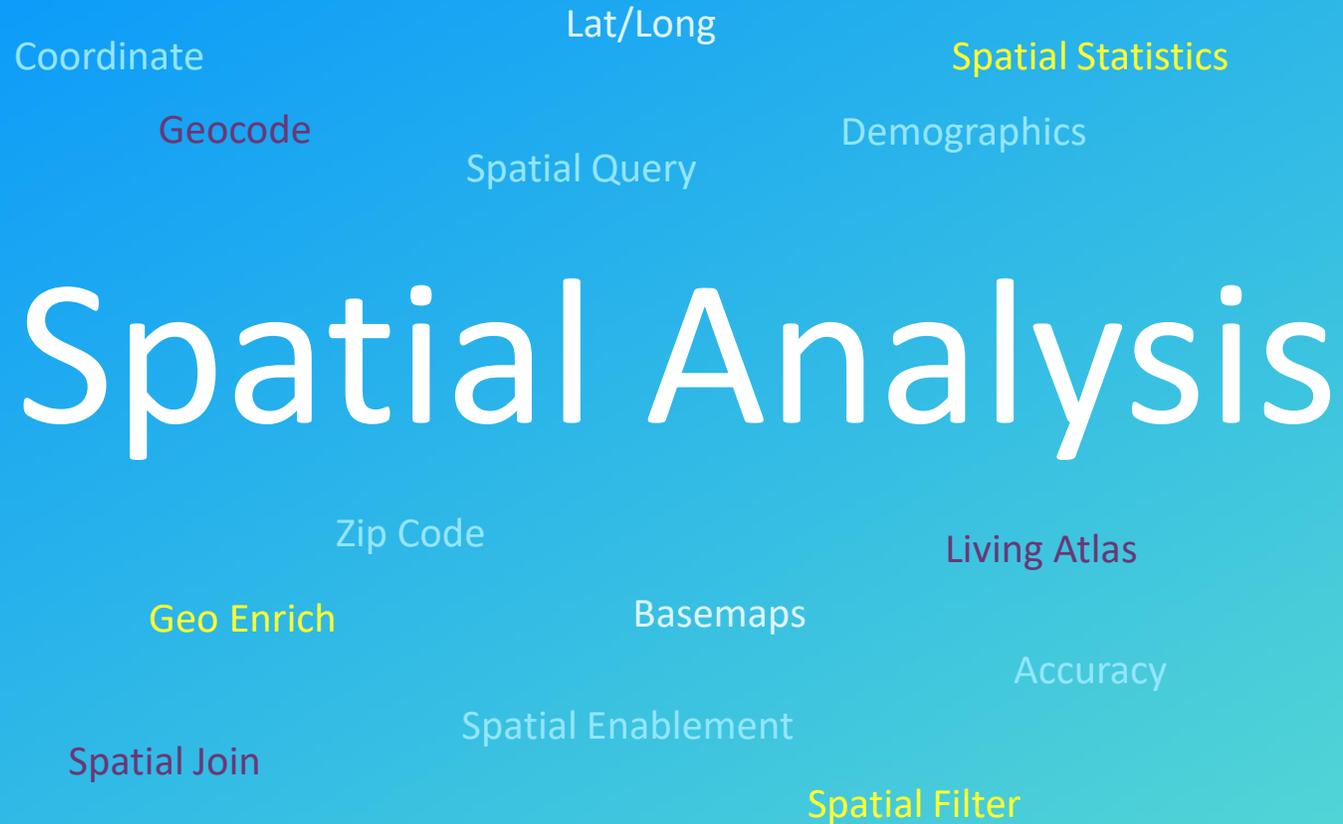


Analysis: Interactivity



Insights vs. Traditional BI

The “GeoSpecial” Approach to BI



GIS and Data Analysis

A GIS is designed to:

- Capture
- Store
- Manipulate
- Analyze
- Manage

Present spatial data

Data analysis process is:

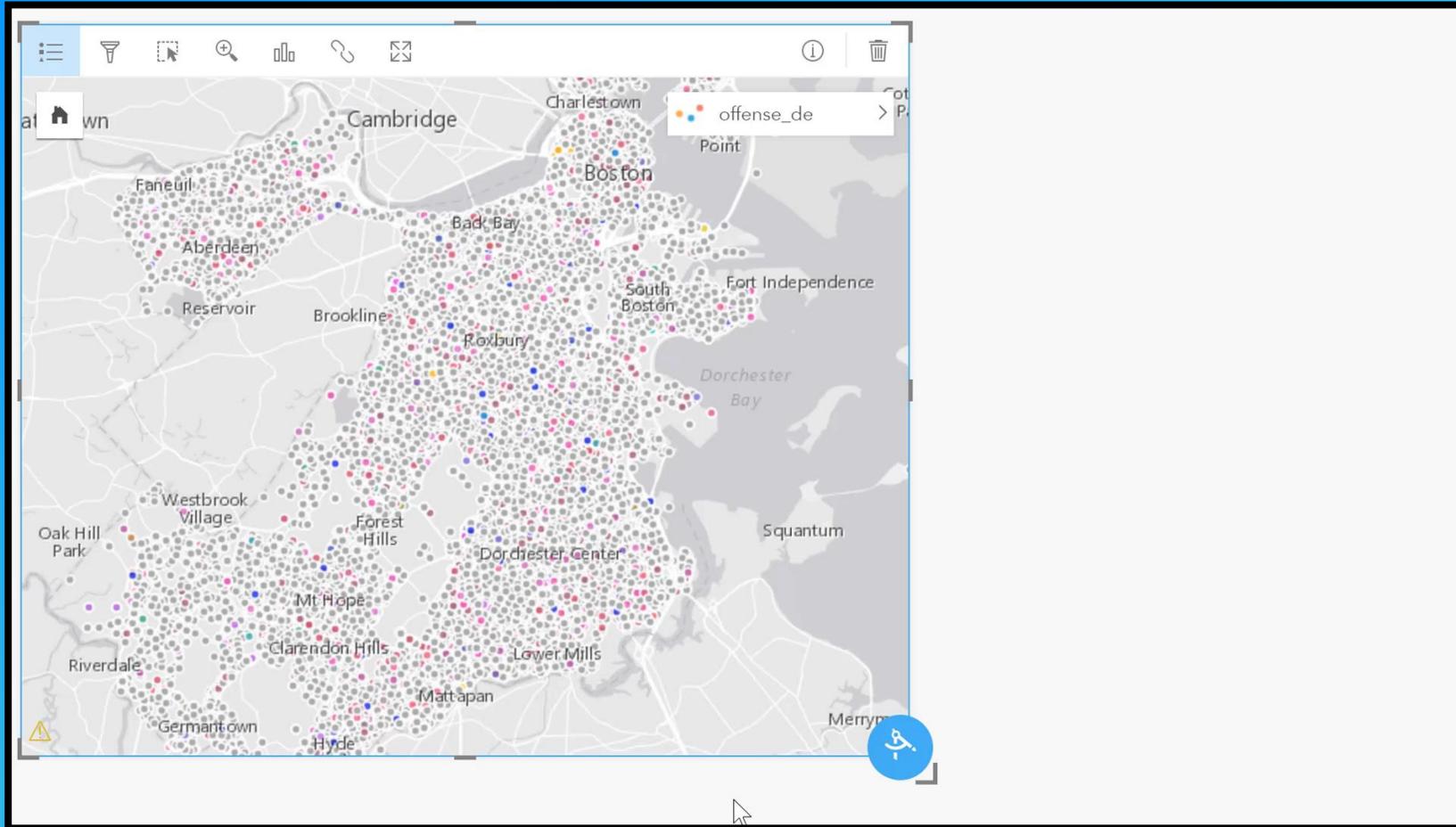
- Cleaning
- Re-organizing
- Modeling data for decision making
- Data from different sources is put together
- Data examined and analyzed

Prepare and Present Data in the Right Form for Decision-Making and Problem-Solving



Analysis: Action Button, starts with questions

Quantify patterns and relationships in the data and display the results as maps, tables, and charts.



Spatial Analysis Tools

Spatial Analytics ✕

Find answers | All tools

How is it distributed?

How is it related?

What's nearby?

How has it changed?

How is it ranked? ▶

Find Answers

Analytics ✕

Find answers | Spatial tools


Create Buffer/
Drive Times


Spatial
Aggregation


Spatial Filter


Enrich Data


Calculate Density


Find Nearest

Spatial Tools



Insights (Analysis)

Explore spatial and non-spatial data



View Data Clock



Calculate %
Change



Time Series



Find Nearest



Spatial Filter



View Heat Chart



Create Attribute
Filter



Create Buffer/
Drive Times



View Chord
Diagram



Calculate Ratio



Classification



Calculate Z-Score



View Scatter Plot



Enrich Data



Calculate Density



Spatial
Aggregation



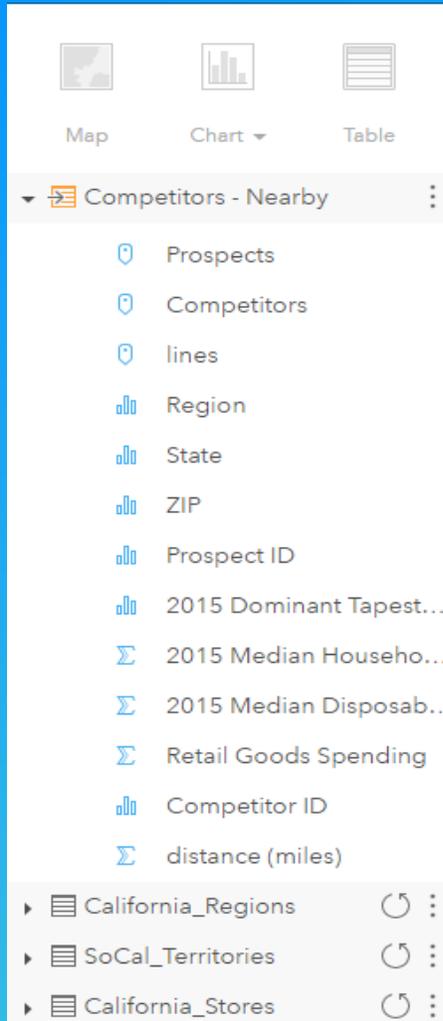
View Histogram



View Box Plot



Result layers

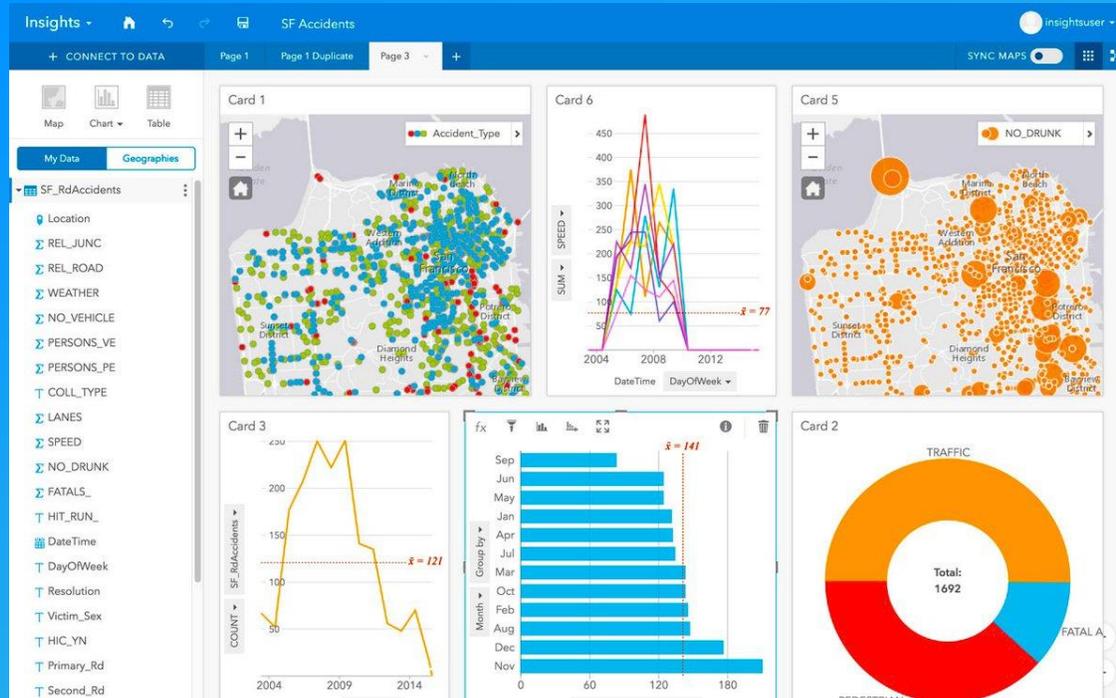


Result layers can be shared back to the portal



Sharing

Share Workbooks, Pages, Models, and Result Datasets.



Insights Page

The 'Share Page' dialog box is shown, allowing users to share their insights. It includes the following fields and options:

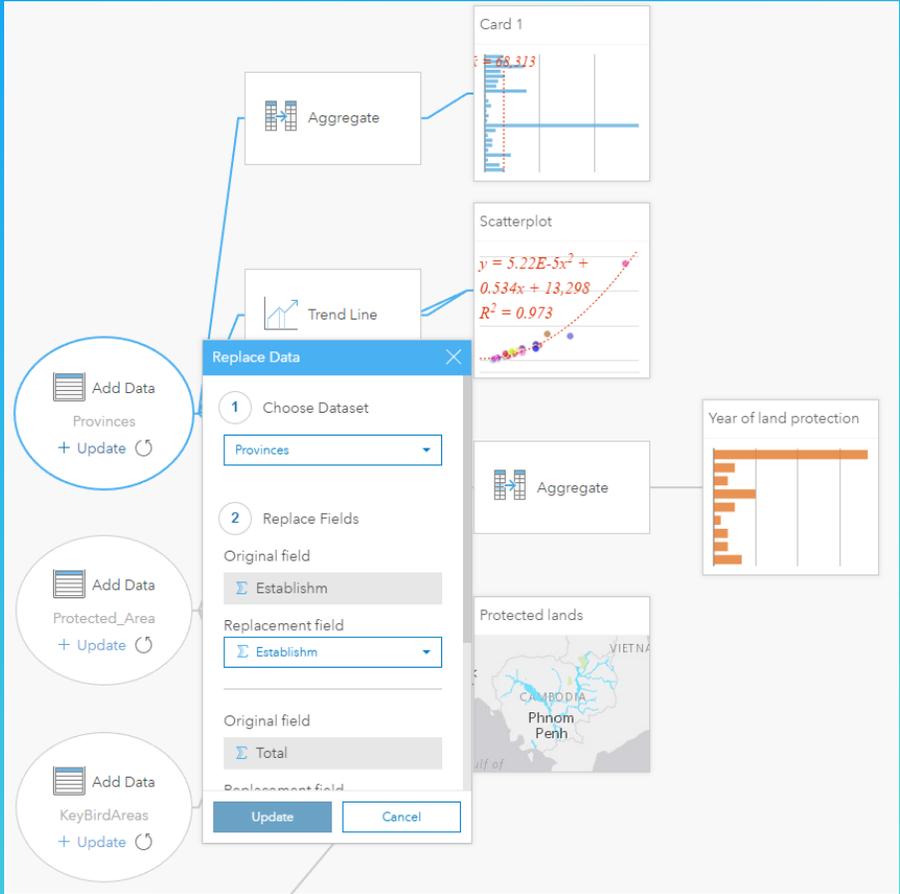
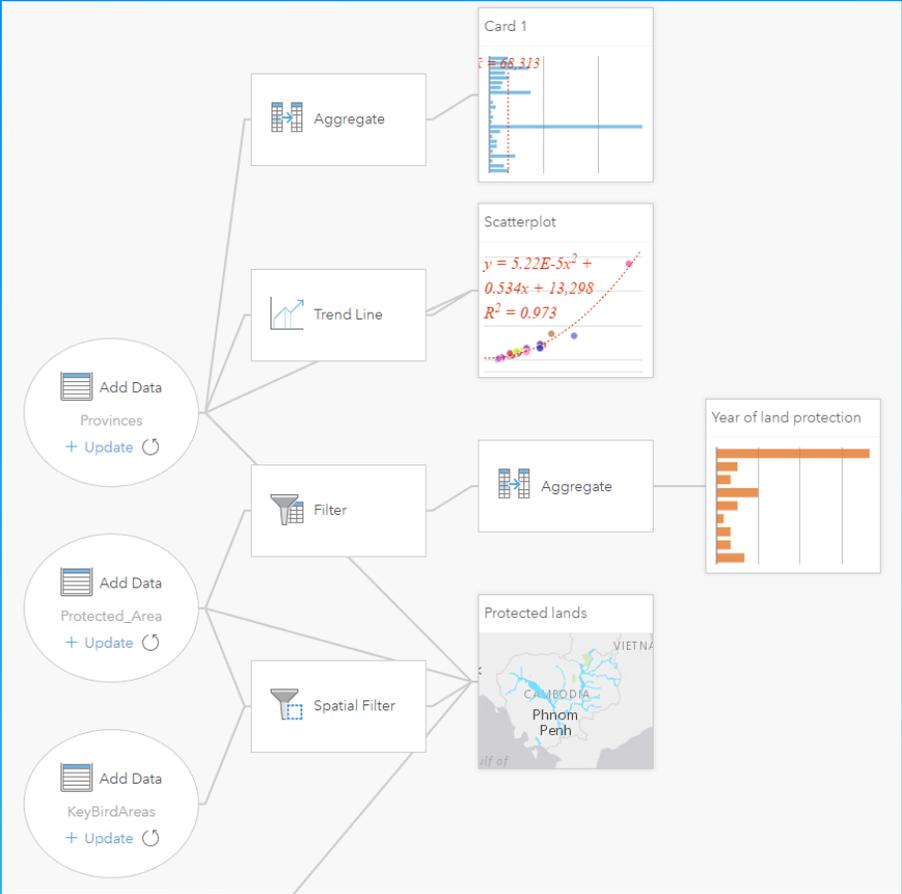
- Title:** A text input field containing 'USA Counties Population'.
- Description:** A text input field with the placeholder text 'Enter a description for this item'.
- Tags:** A list of tags including 'insights', 'USA', and 'Population', each with a close button (X). Below the tags is an 'Add tag(s)' input field.
- Share with:** A section with the following options:
 - Everyone (public)
 - Insights for ArcGIS evaluation
 - These groups:

At the bottom right of the dialog are 'Cancel' and 'Share' buttons.

Share Page



Analysis view and models



Demo



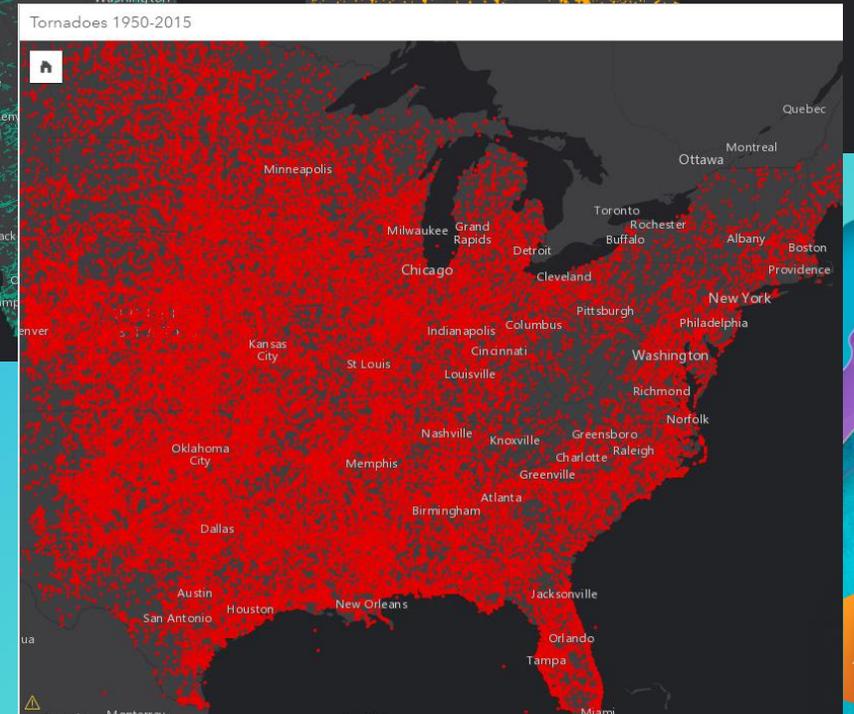
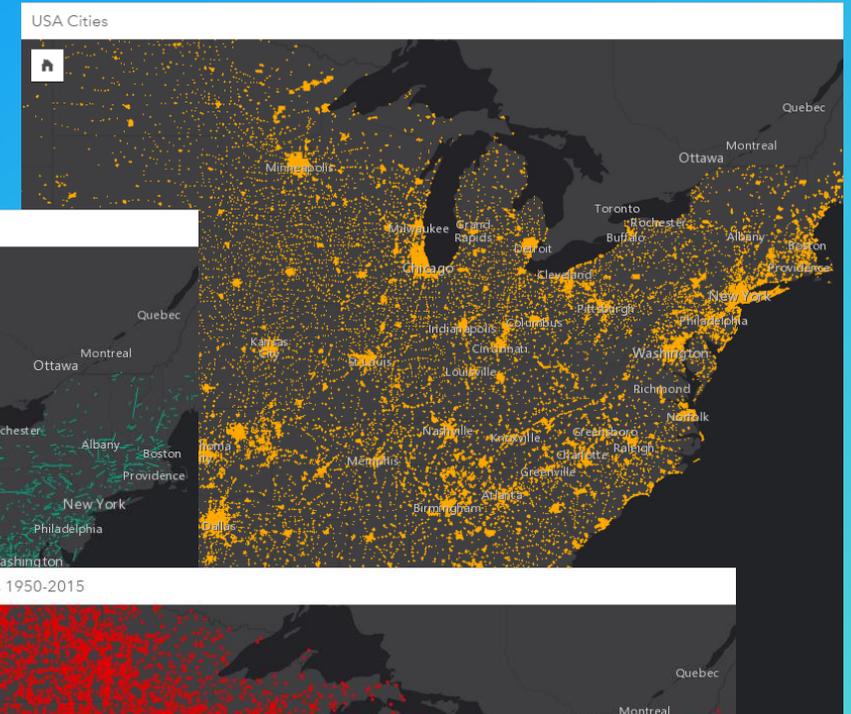
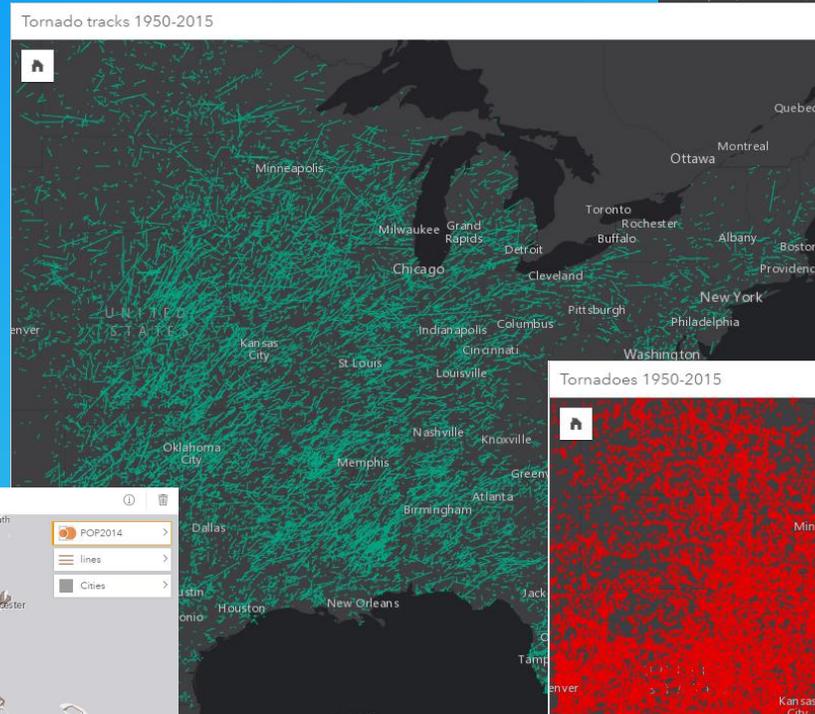
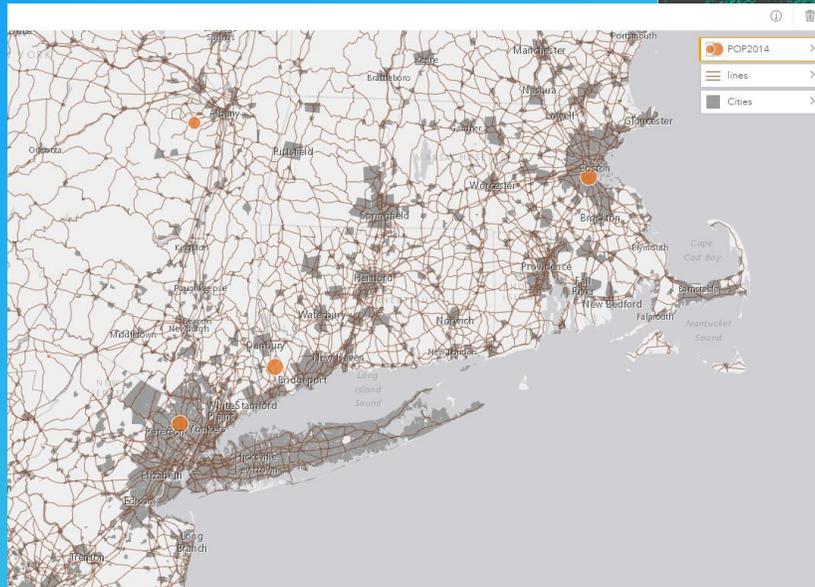
Cards





Map types

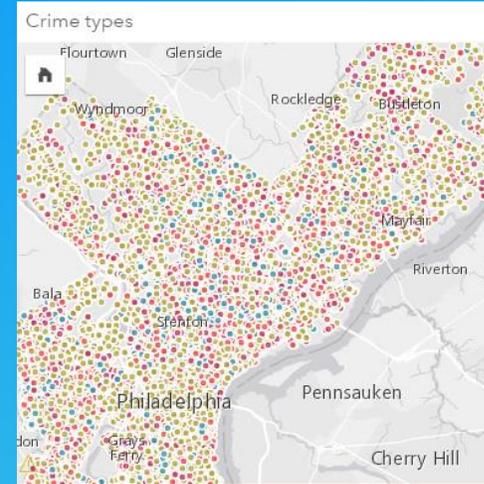
- Analysis and, therefore, **thematic** mapping
 - Light / dark gray basemaps
- Vector only (to date)
 - Points, lines and polygons



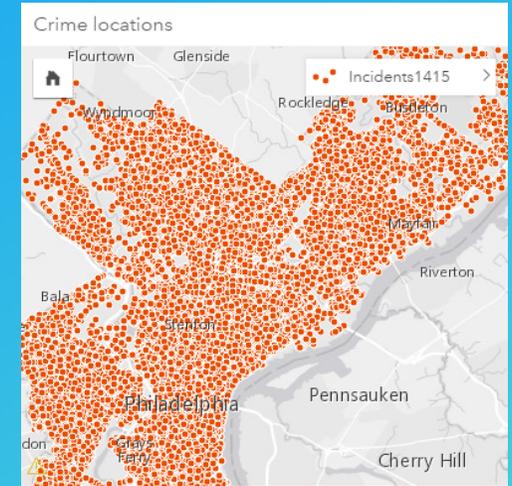
Map symbol types

Quantitative and qualitative options

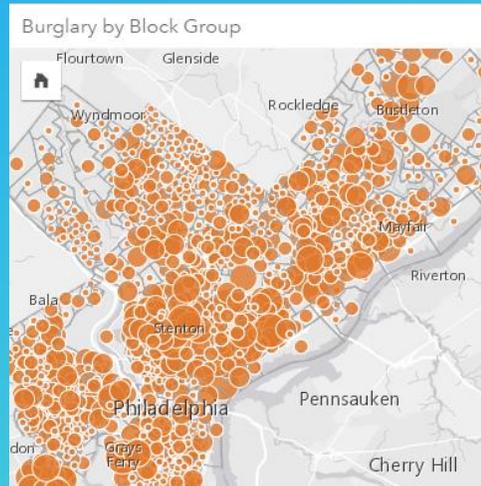
- Types (Unique symbols)
- Locations (single symbol)
- Original symbol
- Counts and amounts (size)
- Counts and amounts (color)



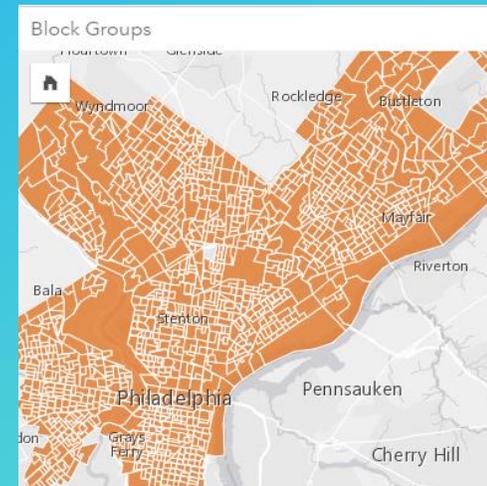
Types



Locations



Counts and amounts (size)



Counts and amounts (Color)



Measure: ascertain the size, amount, or degree of (something)



A bar graph uses either horizontal or vertical bars to show comparisons among categories. They are valuable to identify broad differences between categories at a glance.



A treemap shows both the hierarchical data as a proportion of a whole and, the structure of data. The proportion of categories can easily be compared by their size.



Bubble charts represent numerical values of variables by area. With two variables (category and numeric), the circles placed so they are packed together.



A heat chart shows total frequency in a matrix. Values in each cell of the rectangular grid are symbolized into classes.

Relationship: a connection or similarity between two or more things or, the state of being related to something else



A choropleth map allows quantitative values to be mapped by area. They should show normalized values not counts collected over unequal areas or populations.



A chord diagram visualizes the inter-relationships between categories and allows comparison of similarities within a dataset or, between different groups of data.



Scatterplots allow you to look at relationships between two numeric variables with both scales showing quantitative variables. The level of correlation can also be quantified.



Spider lines, also termed desire lines, show paths between origins and destinations. They show connections between places.

Change: process through which something becomes different, often over time



A bar graph uses either horizontal or vertical bars to show comparisons among categories. They are valuable to identify broad differences between categories at a glance.



A heat chart shows total frequency in a matrix. Using a temporal axis values, each cell of the rectangular grid are symbolized into classes over time.



Bubble charts with three numeric variables are multivariate charts that show the relationship between two values while a third value is shown by the circle area.



Graduated symbol maps show a quantitative difference between mapped features by varying symbol size. Data are classified with a symbol assigned to each range.



A Density/heat map calculates spatial concentrations of events or values enabling the distribution to be visualized as a continuous surface.



A Data clock creates a circular chart of temporal data, commonly used to see the number of events at different periods of time.



Line graphs visualize a sequence of continuous numeric values and are used primarily for trends over time. They show overall trends and changes from one value to the next.



A combo chart combines two graphs where they share common information on the x-axis. They allow relationships between two datasets to be shown.

Interaction: flow of information, products or goods between places



A chord diagram visualizes the inter-relationships between categories and allows comparison of similarities within a dataset or, between different groups of data.



Spider lines, also termed desire lines, show paths between origins and destinations. They show connections and flow between places.

Distribution: the arrangement of phenomena, could be numerically or spatially



Histograms show the distribution of a numeric variable. The bar represents the range of the class bin with the height showing the number of data points in the class bin.



A box plot displays data distribution showing the median, upper and lower quartiles, min and max values and, outliers. Distributions between many groups can be compared.



A choropleth map allows quantitative values to be mapped by area. They should show normalized values not counts collected over unequal areas or populations.



Graduated symbol maps show a quantitative difference between mapped features by varying symbol size. Data are classified with a symbol assigned to each range.



A Density/heat map calculates spatial concentrations of events or values enabling the distribution to be visualized as a continuous surface.



A unique symbol map (areas or points) allows descriptive (qualitative) information to be shown by location. Areas have different fills and points can be geometric or pictorial.

Part-to-whole: relative proportions or percentages of categories, showing the relationship between parts and whole



Donut charts are used to show the proportions of categorical data, with the size of each piece representing the proportion of each category.



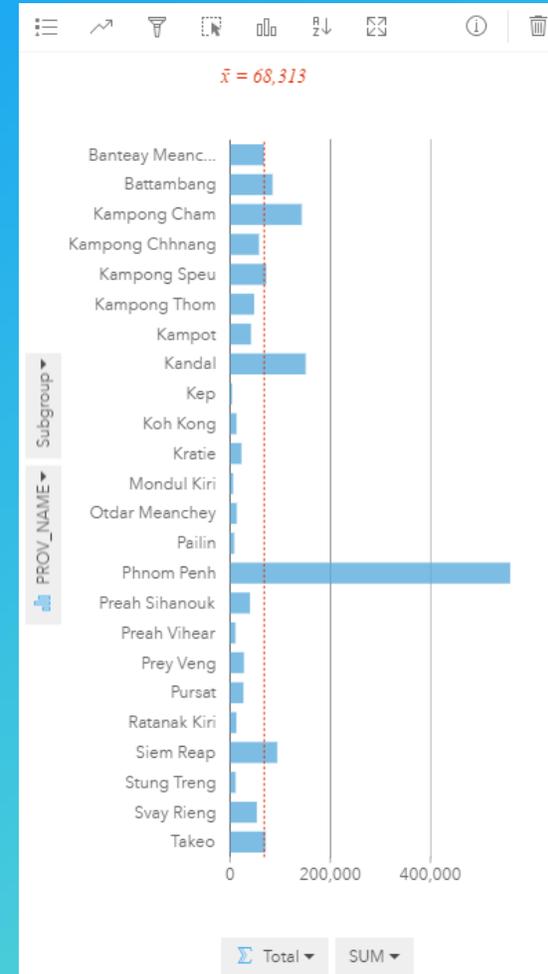
A treemap shows both the hierarchical data as a proportion of a whole and, the structure of data. The proportion of categories can easily be compared by their size.

Bar graphs

Qualitative data *

Compare information

⚠ Not effective with a large number of categories

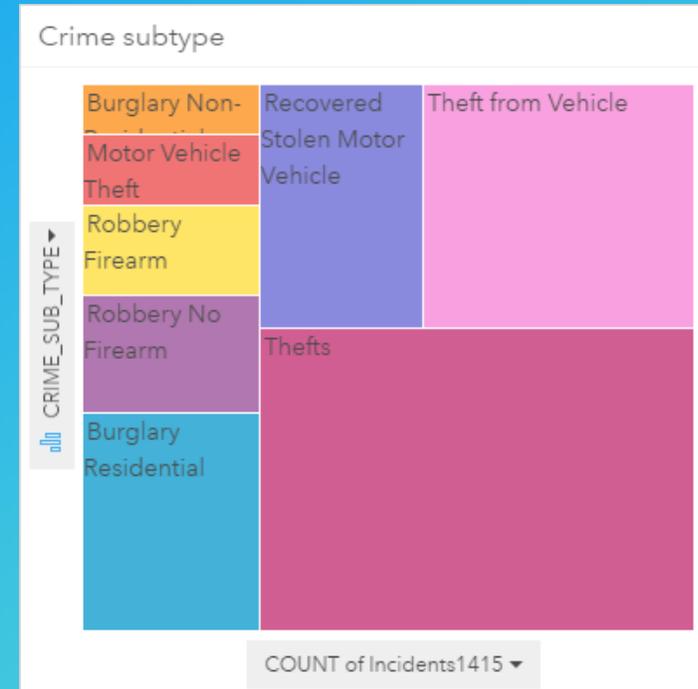




Treemaps

Hierarchical data
as a proportion of a whole

⚠ Not effective for revealing small differences



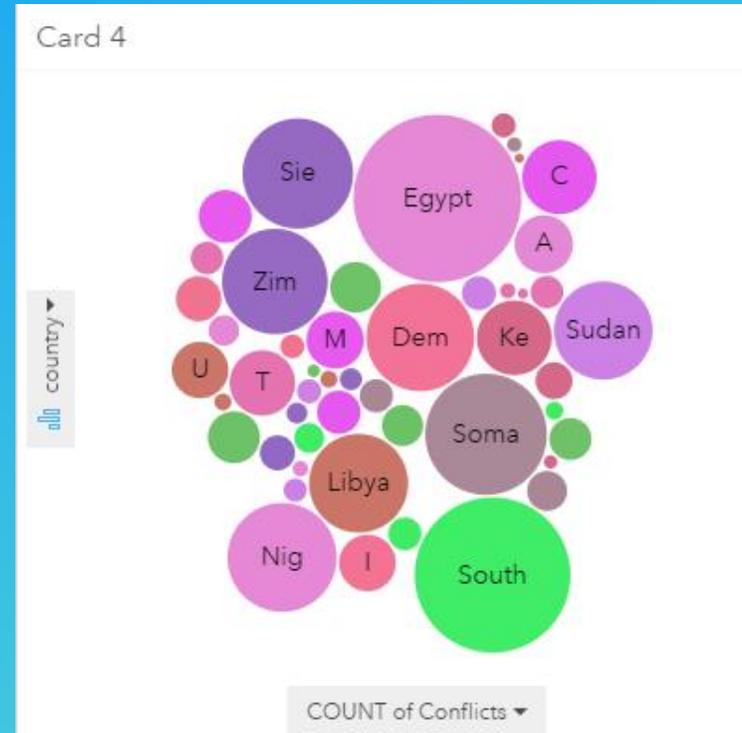


Bubble charts

Qualitative data or quantitative data

Represent numerical values of variables by area in circles

⚠ Less perceptually accurate than bar charts

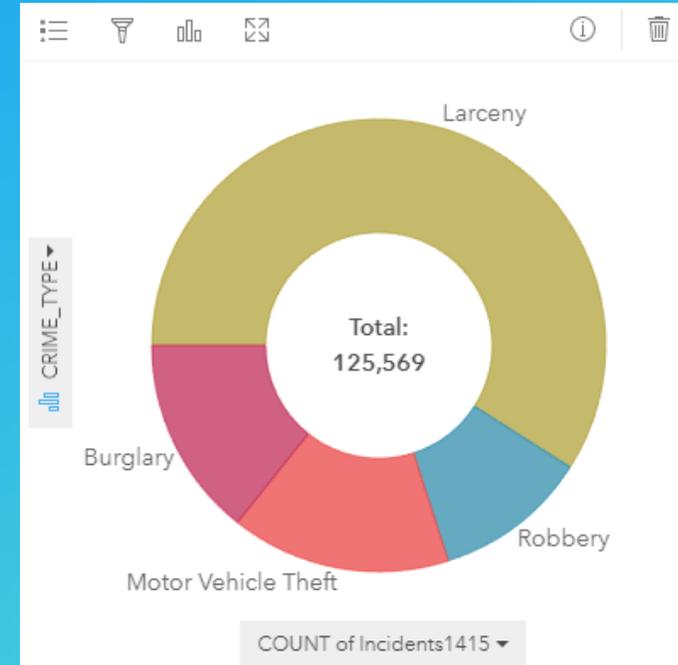




Donut chart

Qualitative data

Show relative proportions or percentages of categories

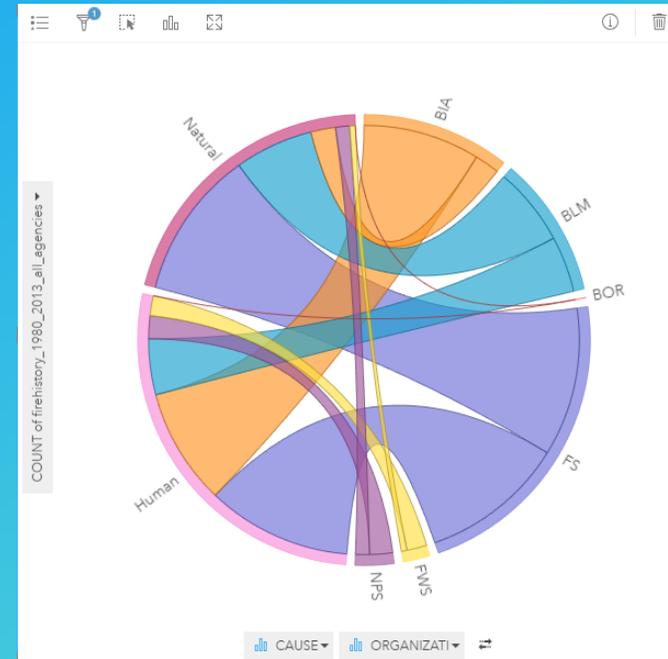




Chord diagram

Visualize the inter-relationships
between categories

 Over-cluttering can become a problem





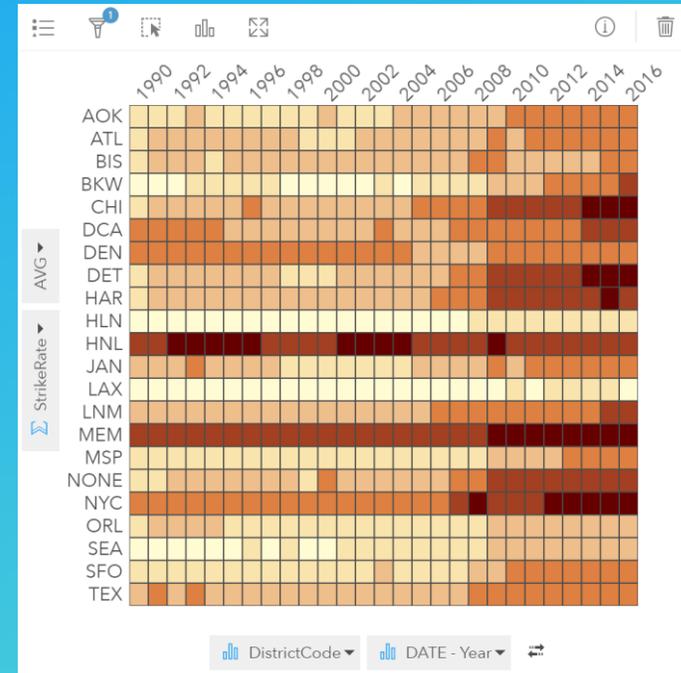
Heat chart

Qualitative data

Shows total frequency in a matrix



Data is classified. Local variations can be hidden





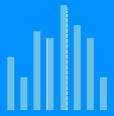
Data clock

Qualitative data

See the number of events at different periods of time

 Can be hard to read with too many categories

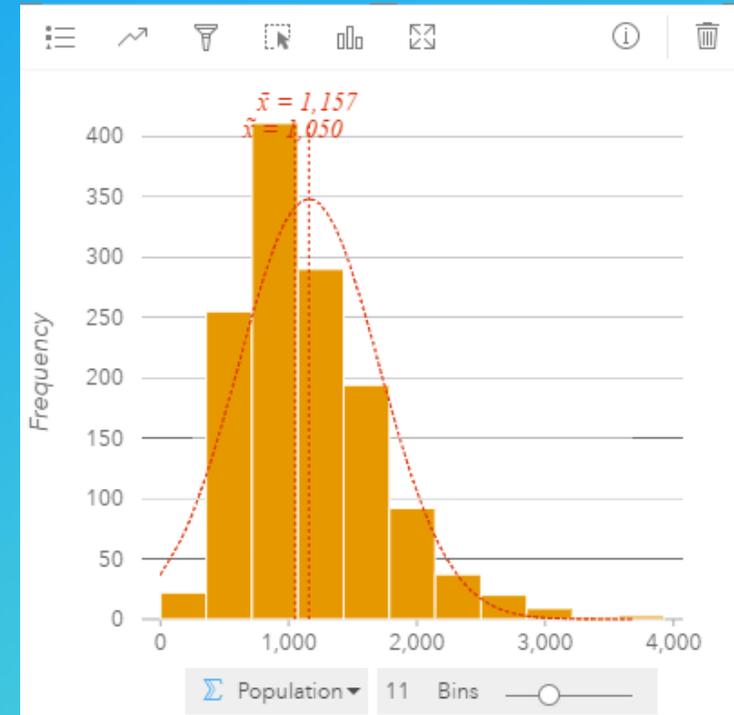




Histograms

Single quantitative field *

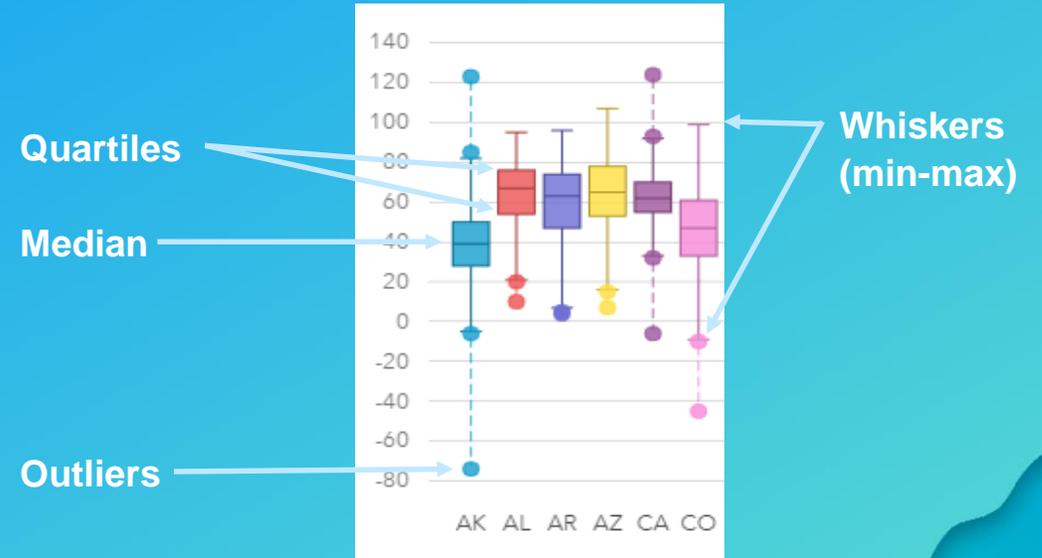
Show the distribution
and statistics of your data





Box plot

Compare distributions
between many groups

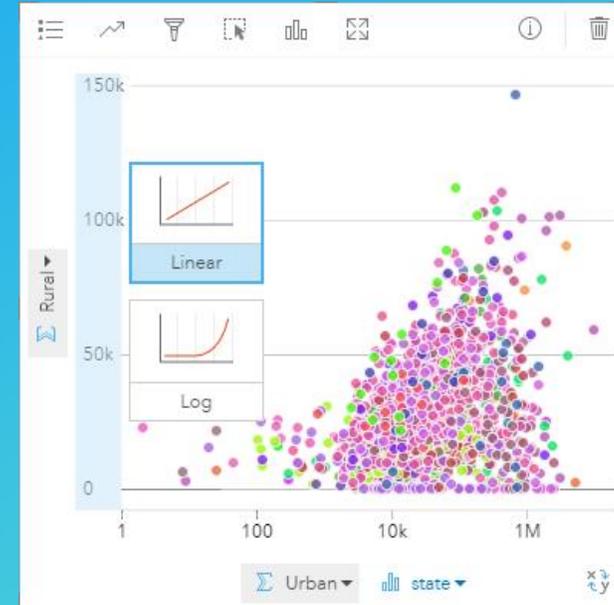




Scatterplots

Look at relationships between two numeric variables

⚠ Should be a logical reason for expecting a relationship

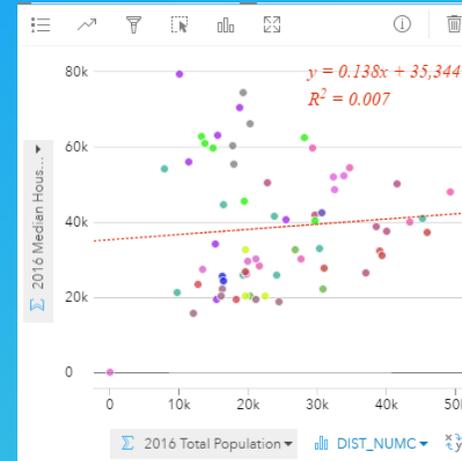




Scatterplot: Correlation

Quantify level of correlation

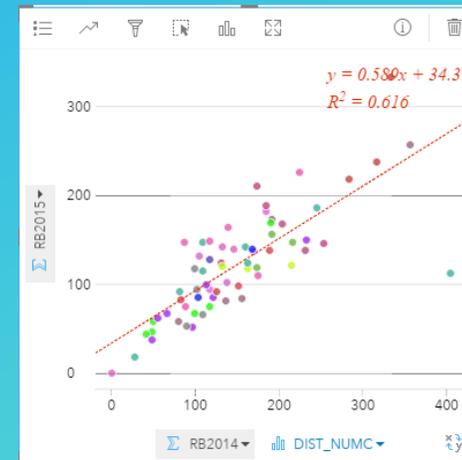
Strength, Direction and Type



No correlation



Good correlation



Positive



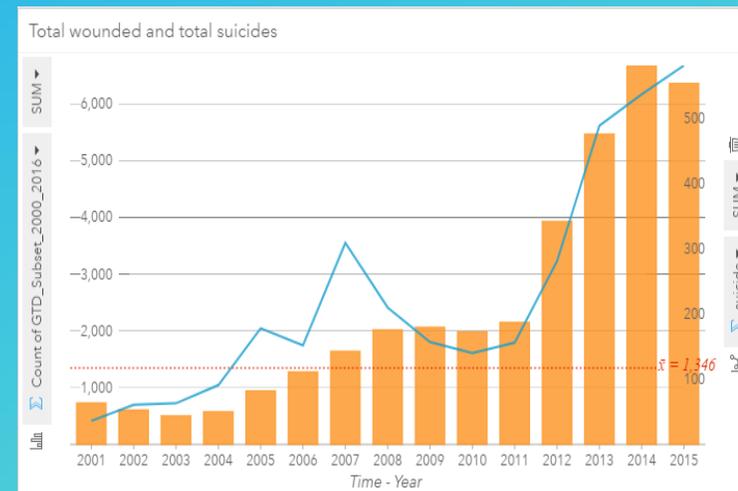
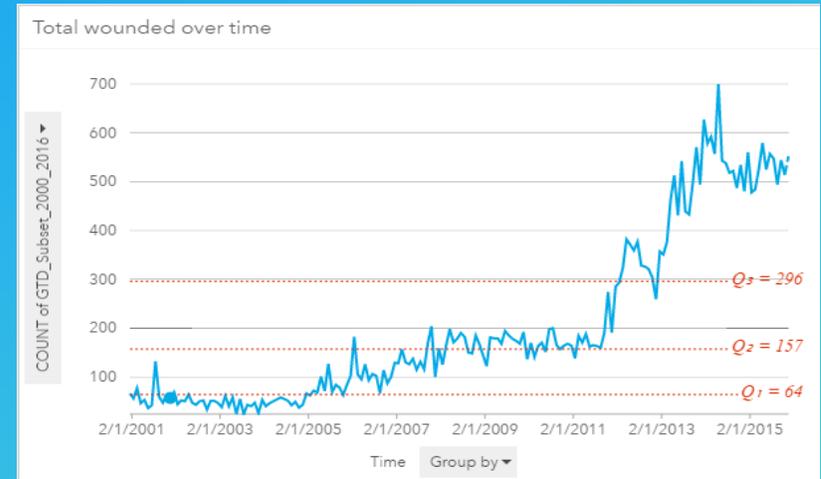


Time series/Line graph

Temporal data *

Highlight overall trends
of values over time

⚠ Should only be used with continuous variables





Summary Tables

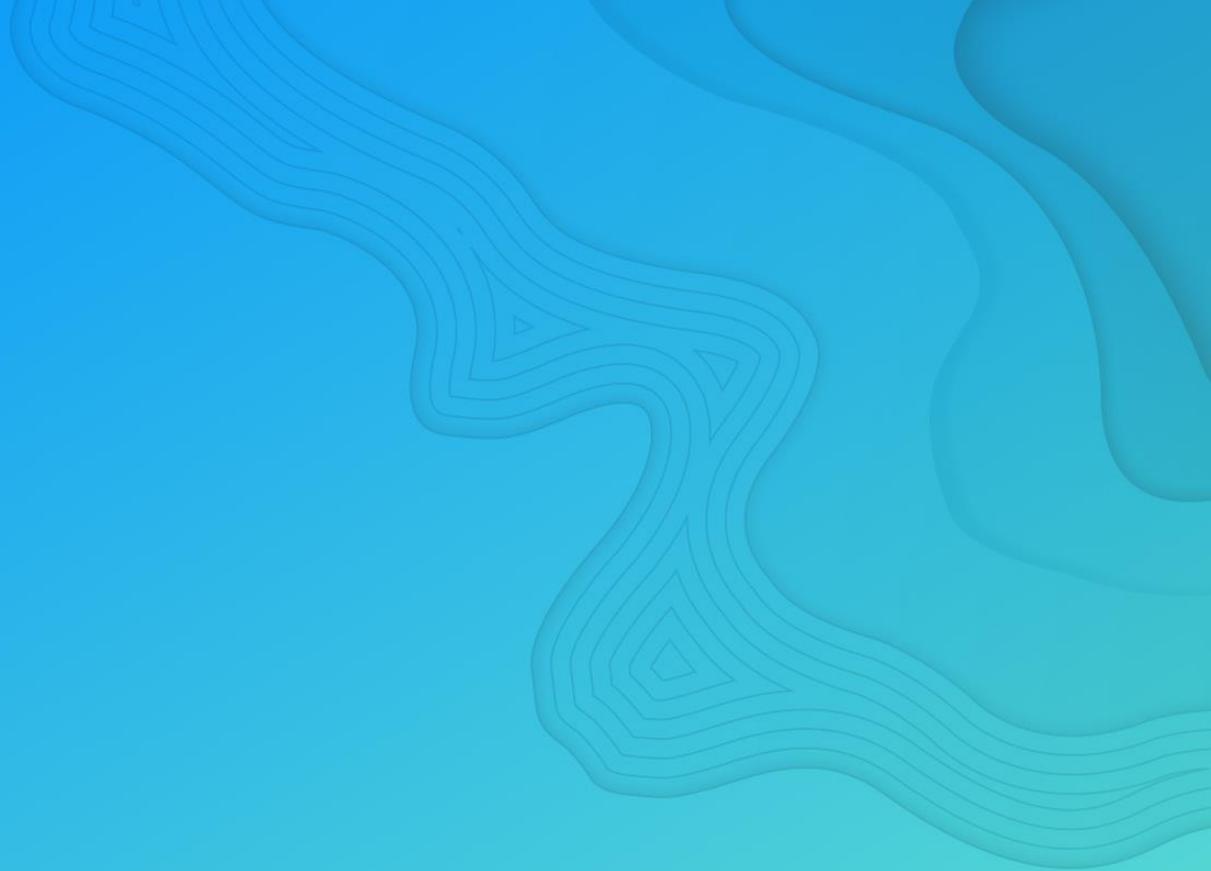
Qualitative and/or quantitative data

Analyze data or look
at exact values

Heart Attack Readmisson			
Ownership↓↑	Name↓↑	Total▼	SUM▼↓↑
Government	VA SAN DIEGO H...		119
	WASHINGTON H...		234
Non-Profit	ADVENTIST MEDI...		63
	AHMC ANAHEIM ...		135
	ALAMEDA HOSPI...		67
	ALTA BATES SUM...		292
	ALTA BATES SUM...		92
	ARROYO GRAND...		30
	BAKERSFIELD ME...		178
	BEVERLY HOSPITAL		87
	CALIFORNIA PAC...		220
Total			31,299



How to Get Insights



Online or Enterprise



ArcGIS Online
SaaS

OR



ArcGIS Enterprise
Your Infrastructure



Enterprise

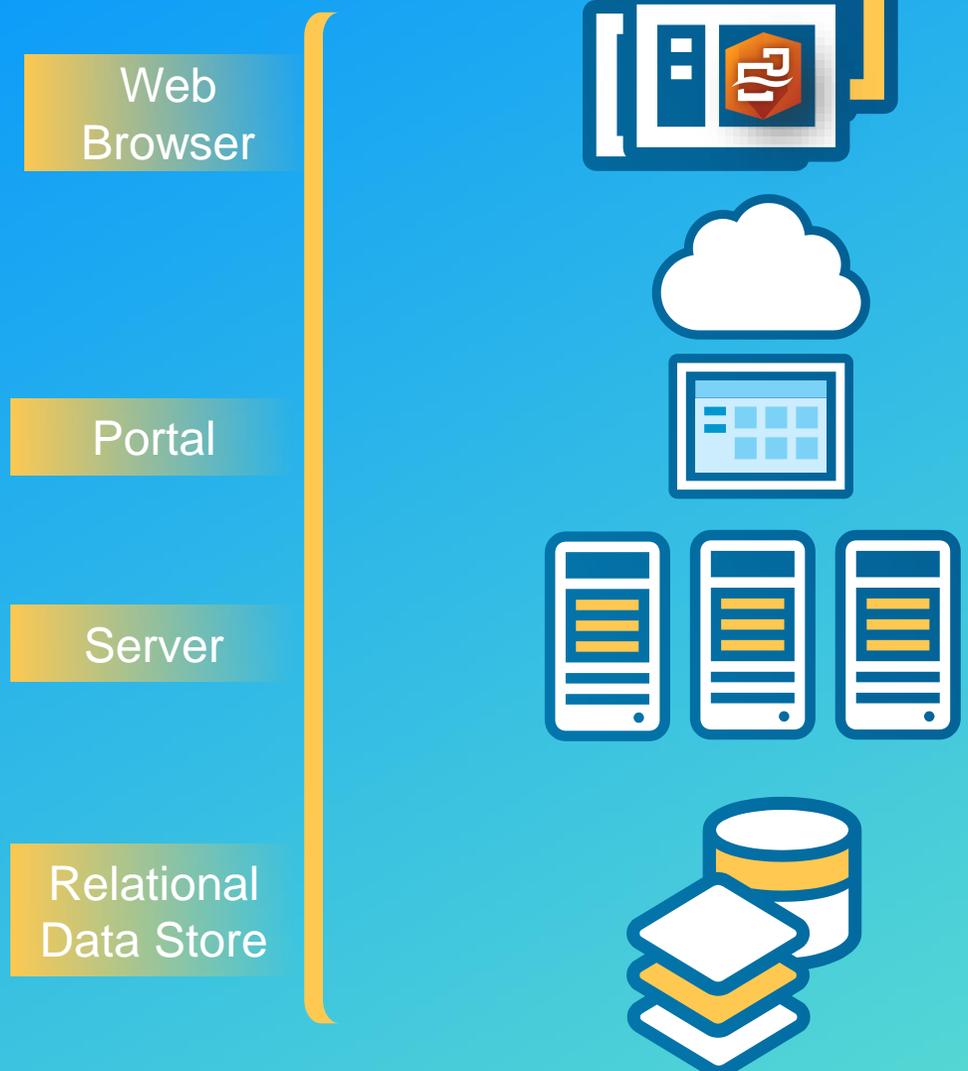
- ArcGIS Enterprise 10.5.1 or 10.6
- Base Deployment
 - Portal, GIS Server, Data Store, Web Adaptors
- Recommend minimum 32 GB of RAM
- Download Insights from MyEsri & install



Your Infrastructure
(Physical, Virtual, or Cloud)



Insights “Stack”



Licensing (Enterprise and Online)

The portal admin must assign licenses

ORGANIZATION

ArcGIS Pro Additional Products

Product	Insights for ArcGIS	Redistricting Online	Drone2Map for ArcGIS	GeoPlanner for ArcGIS	AppStudio for ArcGIS Standard
Licenses	50	50	50	50	50
Available	49	50	50	50	50

Licensed Products for Scott Sandusky (ssandusky)

[-] Esri Applications (Required level)

- Insights for ArcGIS (2)
- Redistricting Online (2)
- Drone2Map for ArcGIS (2)
- GeoPlanner for ArcGIS
- AppStudio for ArcGIS Standard (2)
- ArcGIS Community Analyst (2)
- Navigator for ArcGIS (2)
- ArcGIS Business Analyst (2)

Notify member via email

UPDATE REVOKE ALL CANCEL

... additional steps are required to configure licenses in ArcGIS Enterprise.



Licensing



Level 2 user + Insights license



Level 1 User (Read only)



Sharing



Anonymous access
Public



Level 1 User
Viewer



Level 2 User + Insights
Analyst



Sharing



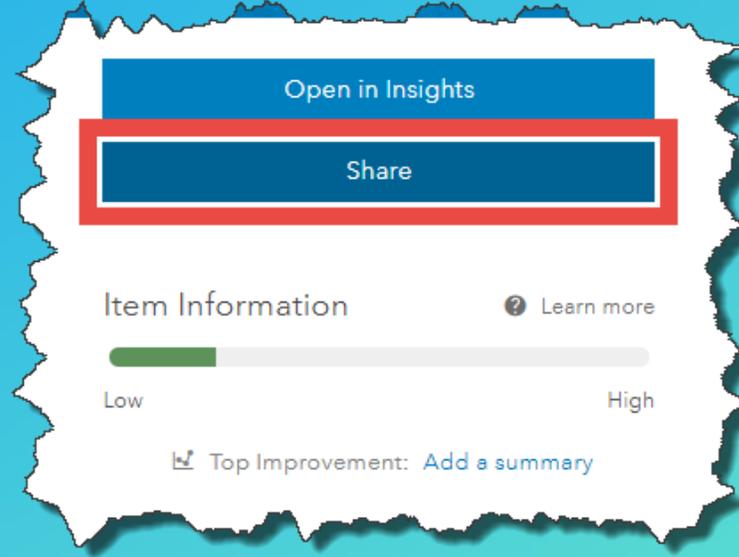
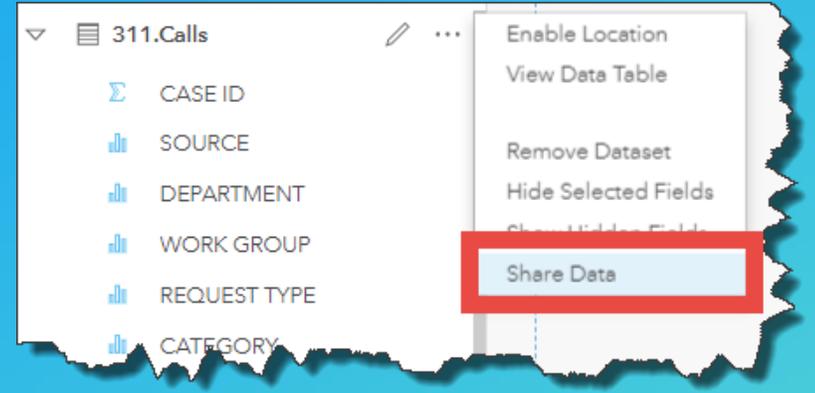
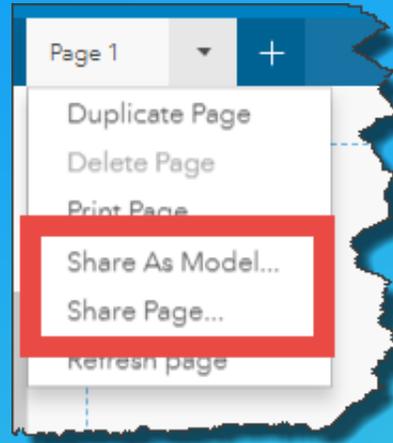
Insights Analyst
Level 2 + Insights

Page

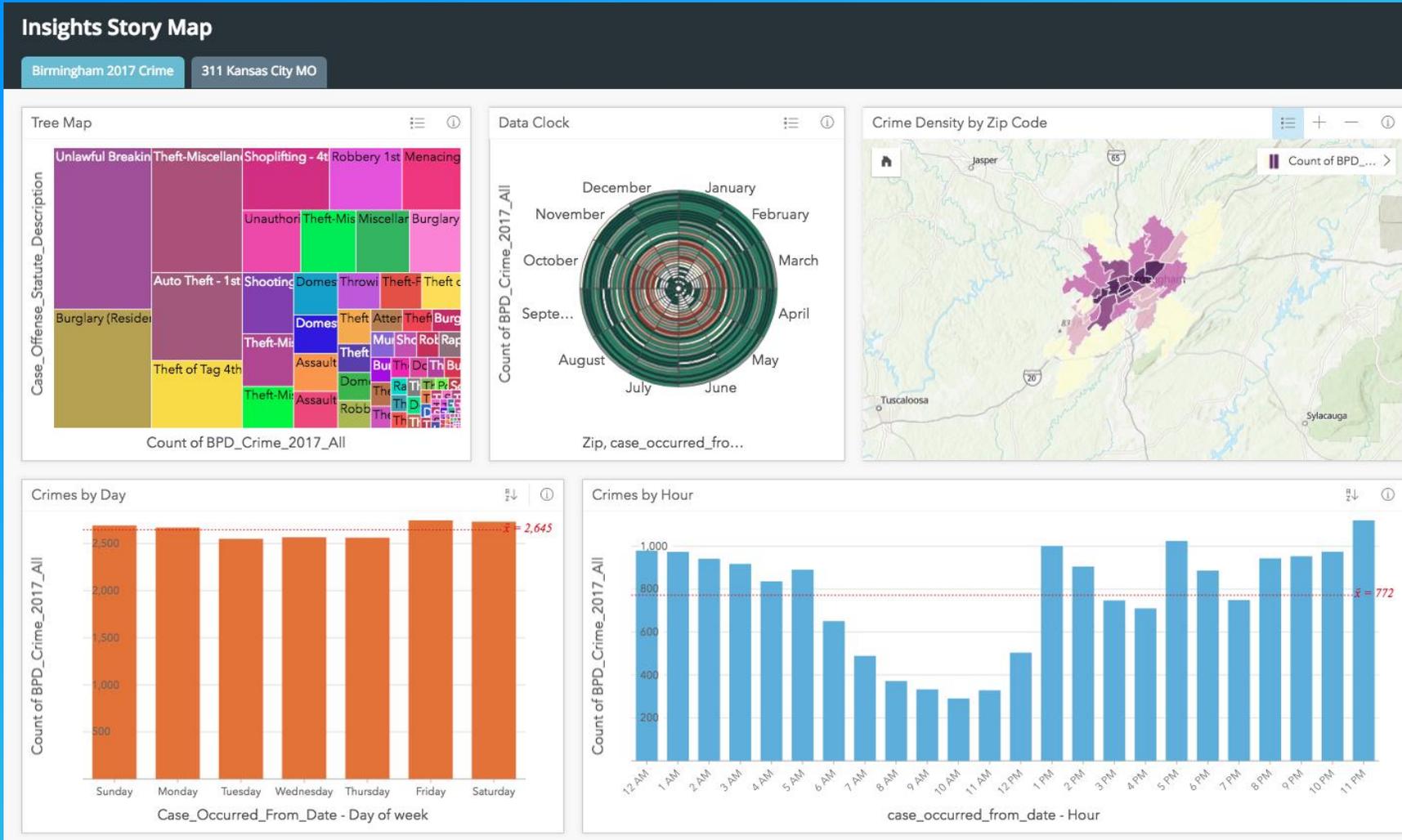
Workbook

Data

Model



Sharing



Insights as a capability within ArcGIS

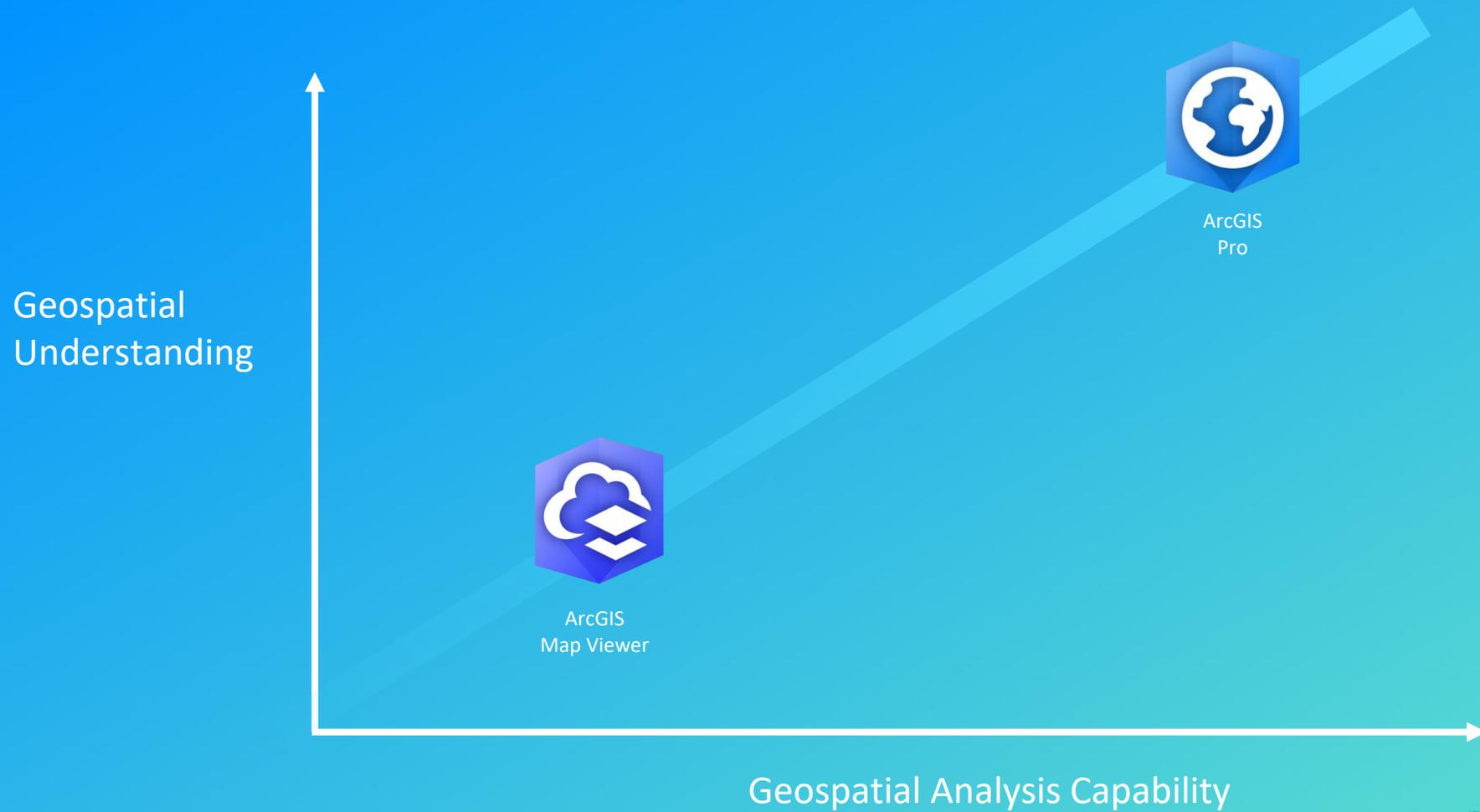


When should I use Insights?

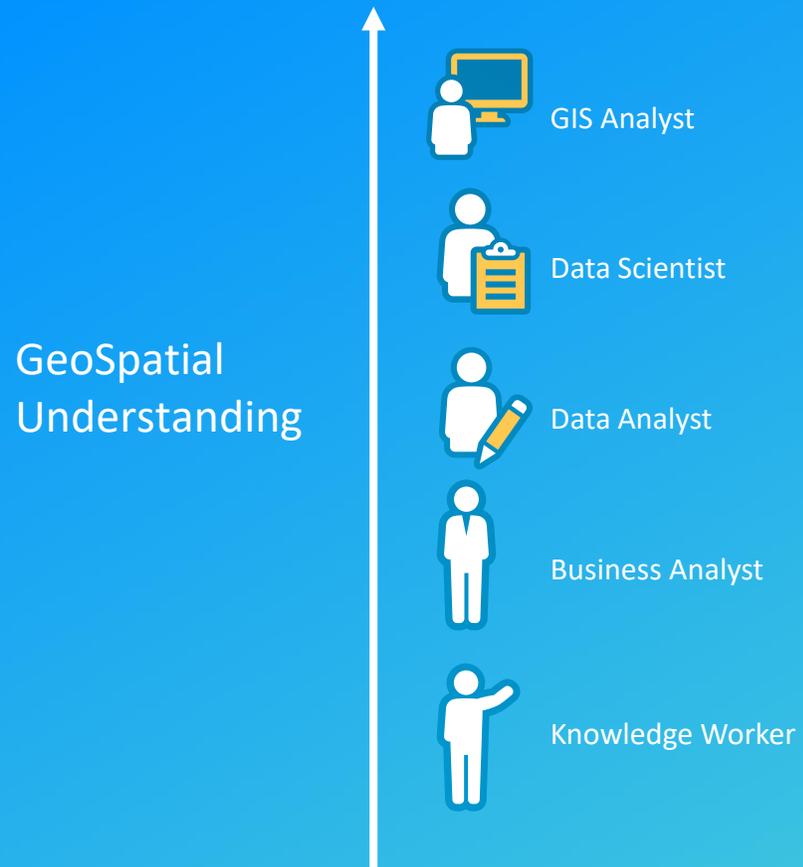


When should I use Insights?

Apps With Purpose



Usable Across Roles and Skill Levels



Insights for ArcGIS



When to Use What

Apps with a Purpose



Insights for ArcGIS



Operations Dashboard
for ArcGIS



Insights Within the Platform

Working Together Across ArcGIS



ArcGIS Pro



ArcGIS Enterprise



ArcGIS Online



Story Maps



ArcGIS Hub

Preprocess
and Analyze

Access and Manage

Share

Multiple Apps and Products, Working Together as One

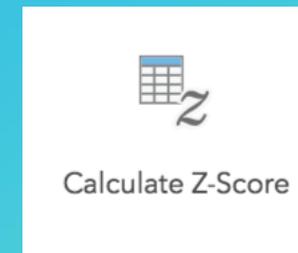
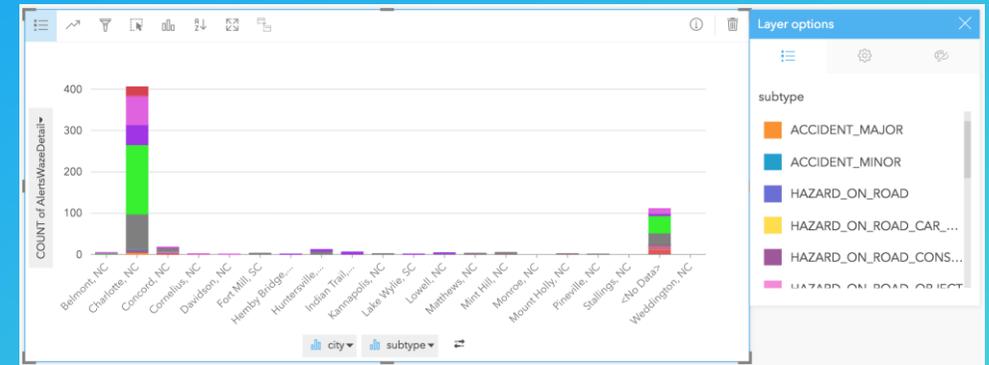
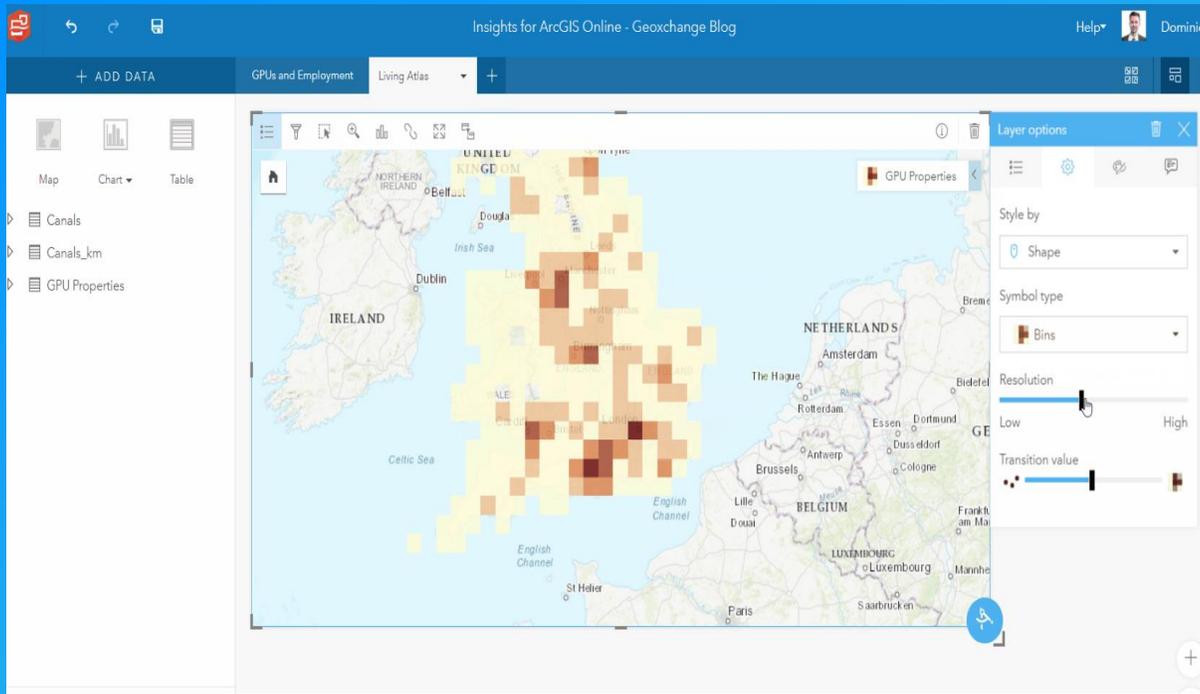


What's New in 2.3

The background features a gradient from dark blue on the left to light teal on the right. In the bottom-left corner, there are several overlapping, wavy, organic shapes in shades of teal and purple. In the top-right corner, there is a faint, light-colored topographic map pattern with concentric contour lines.

Insights for ArcGIS

What's "New"



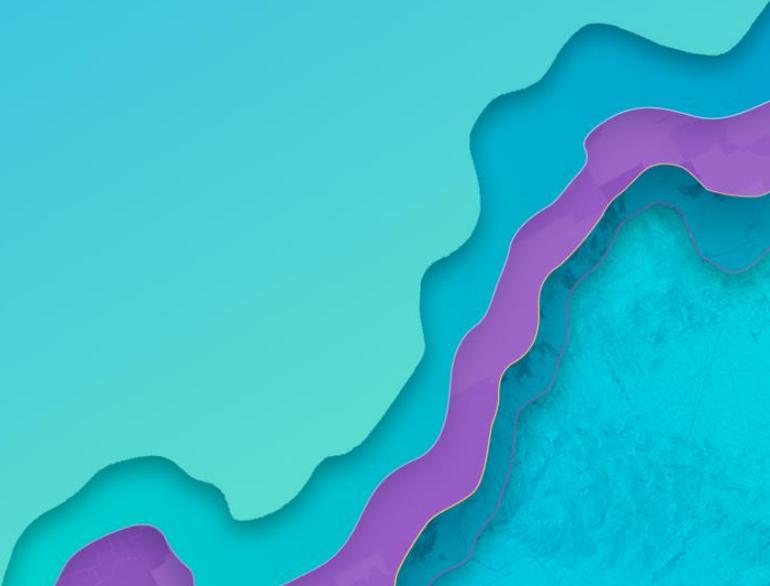
Cross filters



Cross filters are a way to filter your data using a selection on a different card. When the **Enable cross filter** button is activated on a card, a filter will be applied to that card whenever a compatible selection is made. In order for a selection to be compatible, the card with the filter and the card with the selection must be using the same dataset.

In summary...

Start with the **Data**, ask **Questions**, get **Insights**,
Document workflows, and **Share** your stories.



Questions



Insights for ArcGIS



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THE
SCIENCE
OF
WHERE

