

Abstract

This course will give attendees the information necessary to understand the value that Insights for ArcGIS brings and, therefore, how it can be positioned for your customers.

The workshop will cover the foundational concepts of working with Insights for ArcGIS, demonstrating the drag-and-drop interface and how to perform iterative analysis of data, wherever it comes from, such as Excel spreadsheets, ArcGIS services or enterprise databases. We will then take a look at the experience, talking through the architecture to show how to get the most out of Insights with analysis workflows.



Insights for ArcGIS



2018 Esri Partner Conference | Palm Springs, CA

Agenda



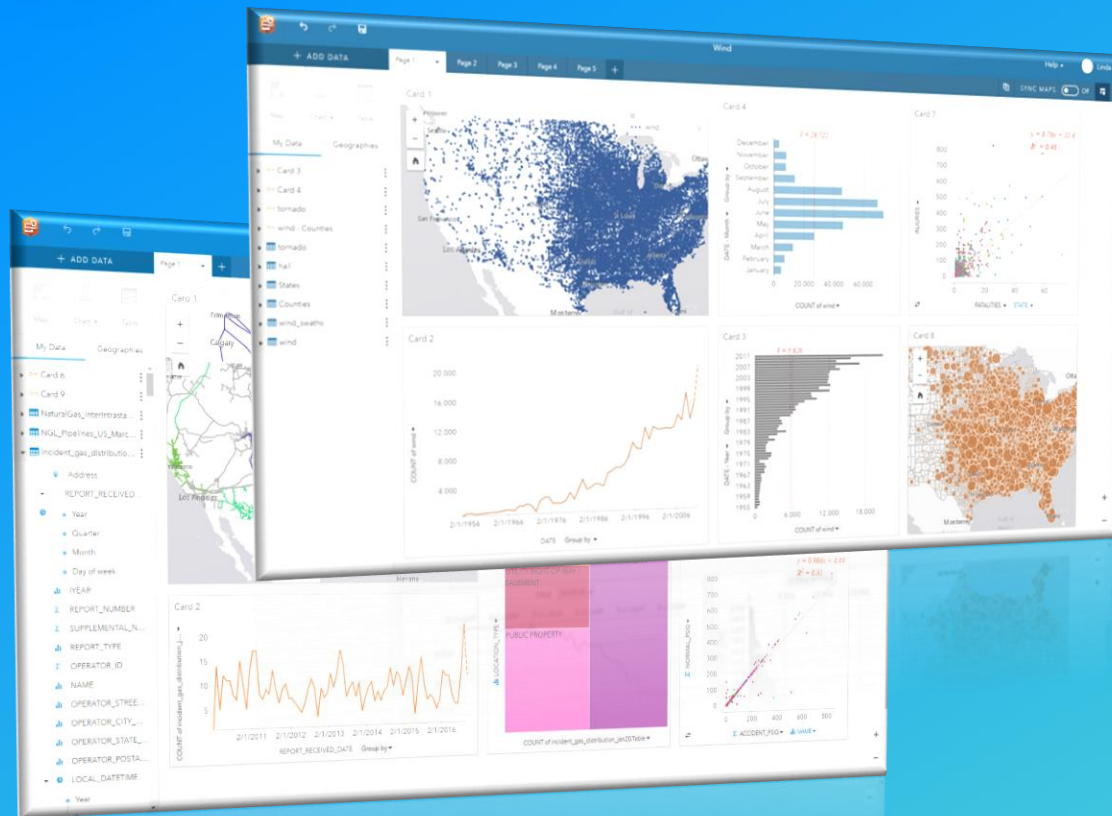
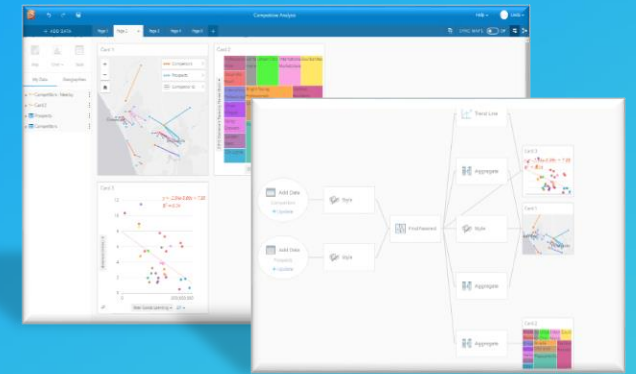
- 0900 – 1030
 - Welcome / Introductions
 - Getting started with Insights
 - Demonstration
 - Behind the scenes
 - How to get Insights
- 1030 – 1045 - Coffee Break
- 1045 - 1200
 - Insights as a capability of ArcGIS
 - The value of analysis with Insights
- 1215 – 1330 - Lunch
- 1330 - 1430
 - Setting up for Exercises
 - Tour of Data holdings
 - Hands On: Exercise #1
- 1430 – 1445 - Coffee Break
- 1445 - 1600
 - Recap of Exercise #1
 - Hands On: Exercise #2
 - BYOD time
 - Road map and Q & A



Getting started with Insights



Insights for ArcGIS: Explore a new world in your data



- Discover the power of exploratory analysis
 - Visual and intuitive
- Combine Analysis and Visualization on cards
 - Linked and responsive
- Drive impactful decisions
 - Learn, record, share and collaborate

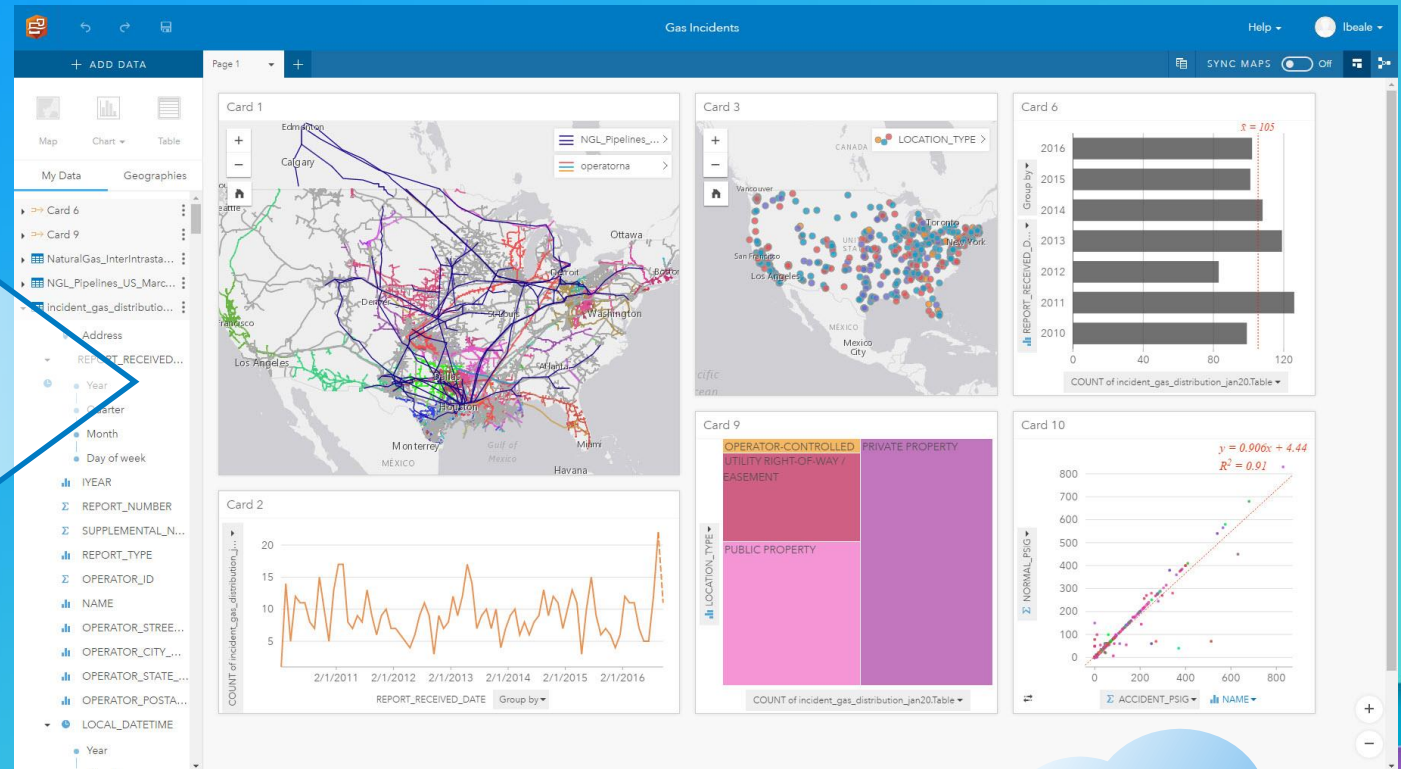
Quickly Increase Decision Confidence with Insights for ArcGIS



Insights for ArcGIS

Data -
Spatial and
Tabular

Visualization
& Analysis



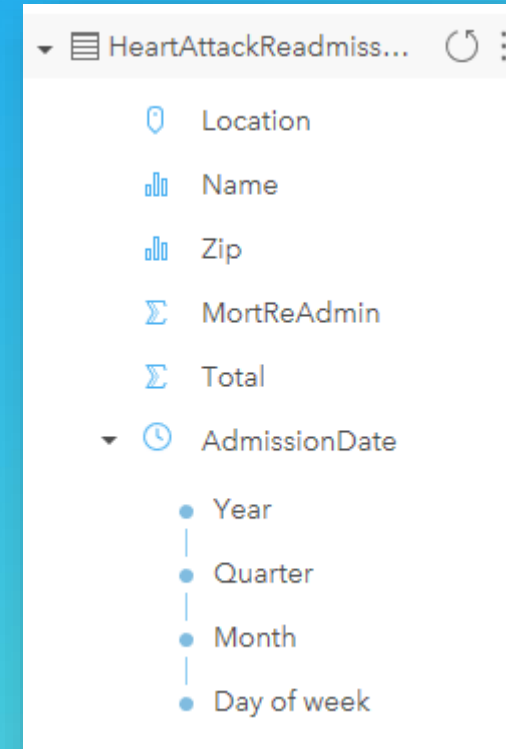
Insights page in ArcGIS



Working with Data – Intelligent defaults

Fields, or attributes are defined to a role

- Insights works directly against the fields
- Dimensional model created behind the scenes
 - Geo-Dimension
 - Temporal-Dimension
 - Categorical (Strings)
 - Quantitative (Numbers)



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

Relationships

Create Relationships

My Data

- ✓ well_production
- ✓ well_attributes

well_production

well_attributes

API

Edit Relationship

Choose Relationship Type

Relationship type determines the way data is combined.

Intersect All Left Right

Choose Fields

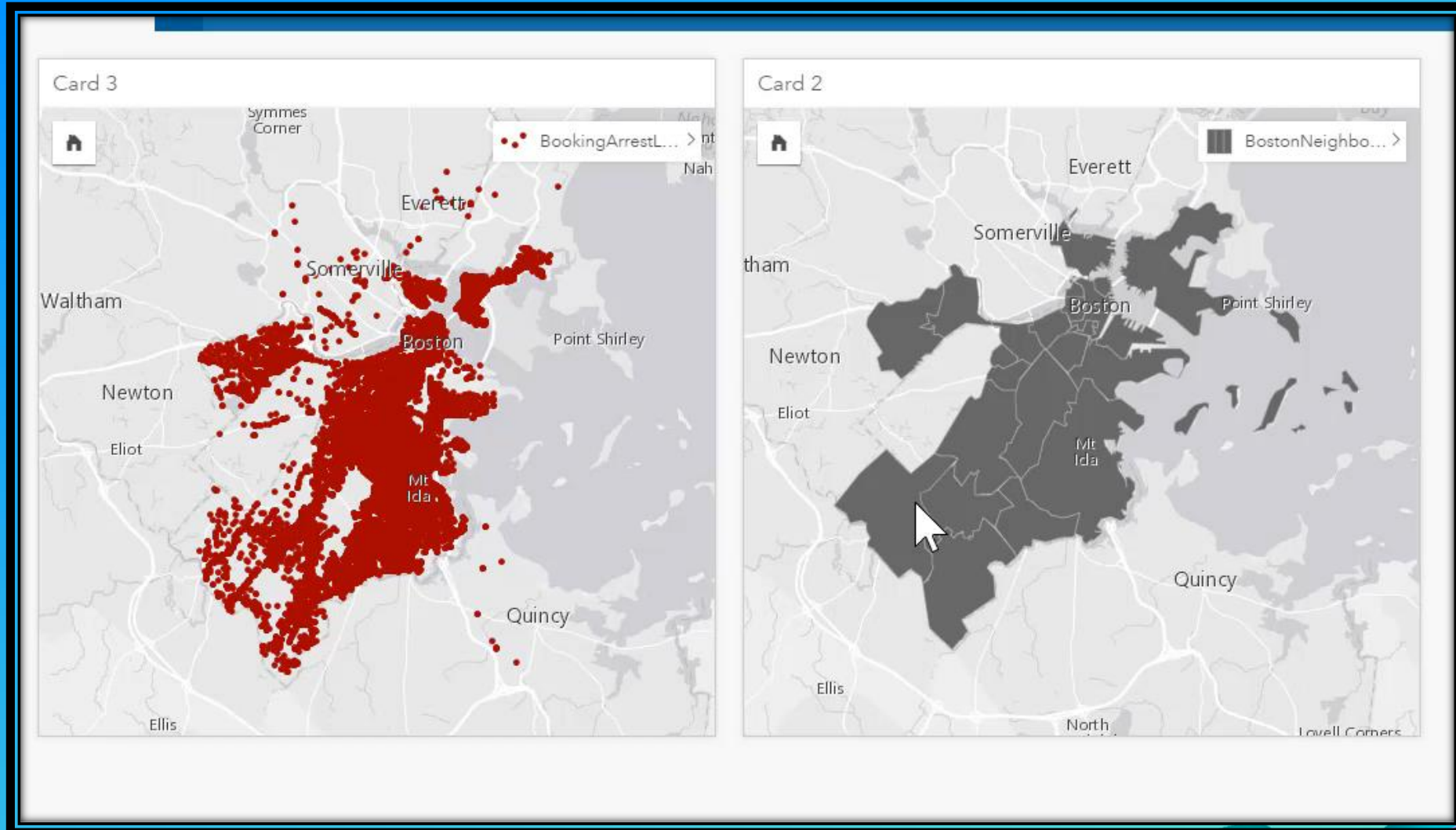
Choose the fields you want to base the relationship on.

API — API

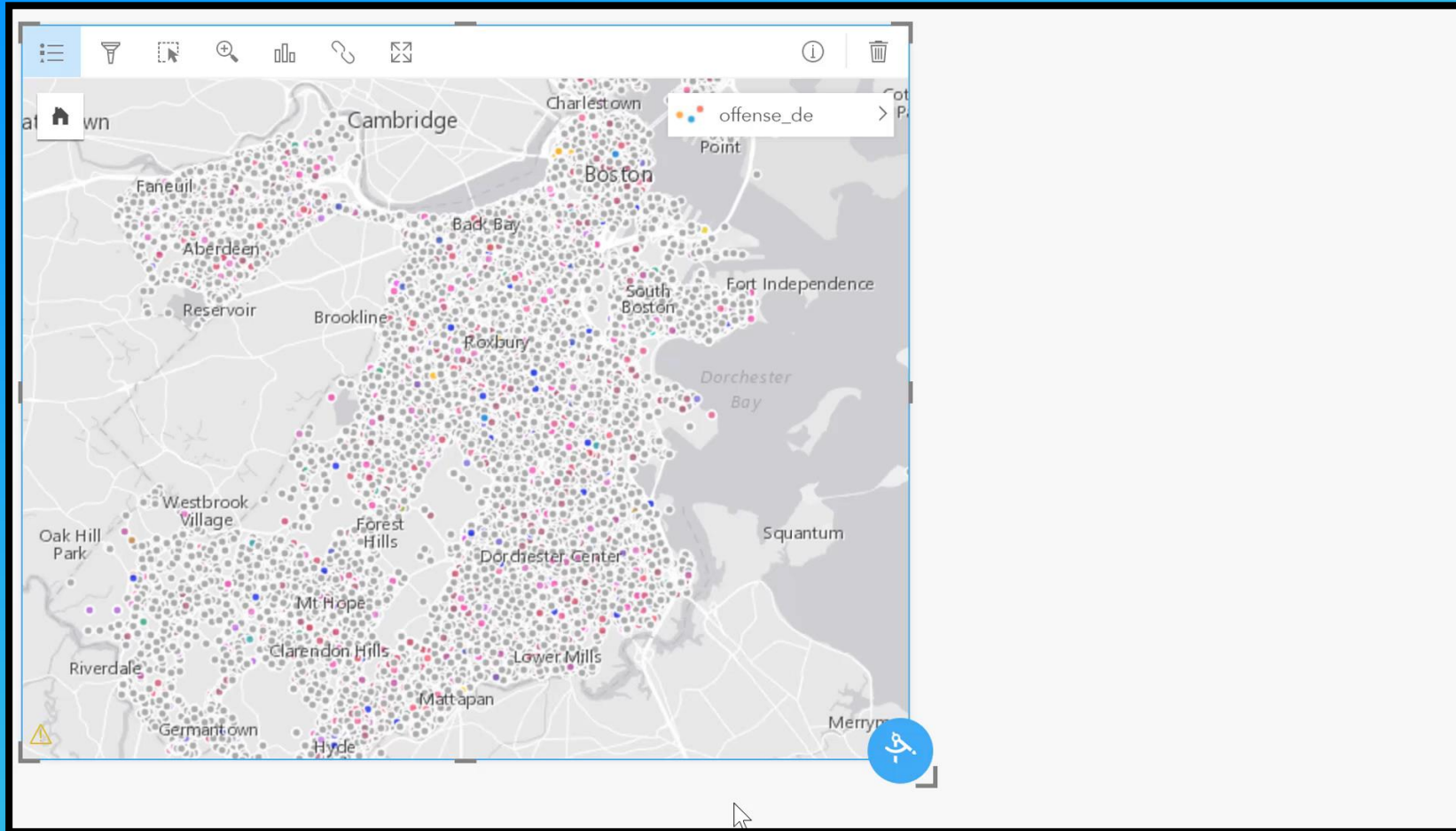
+

Cancel Finish

Analysis: Interactivity

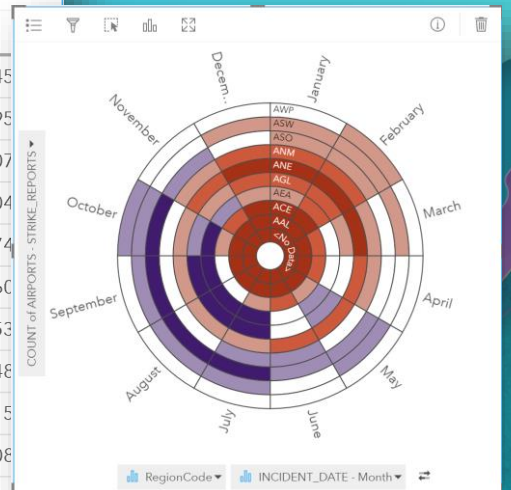
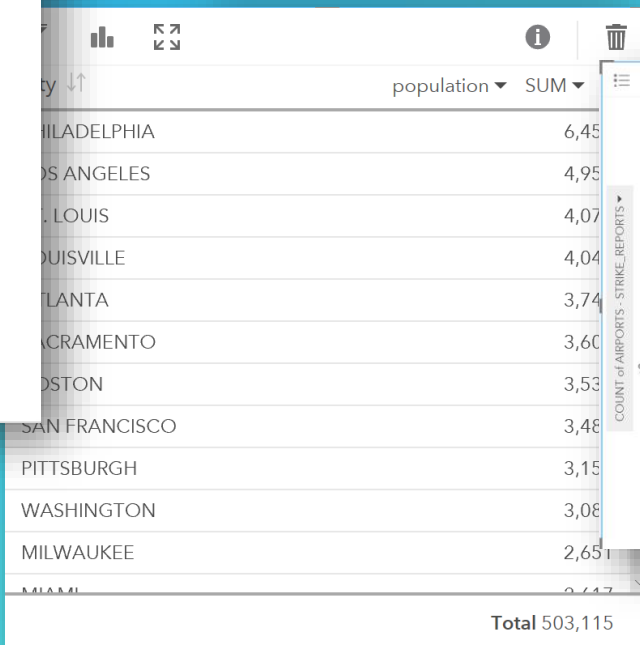
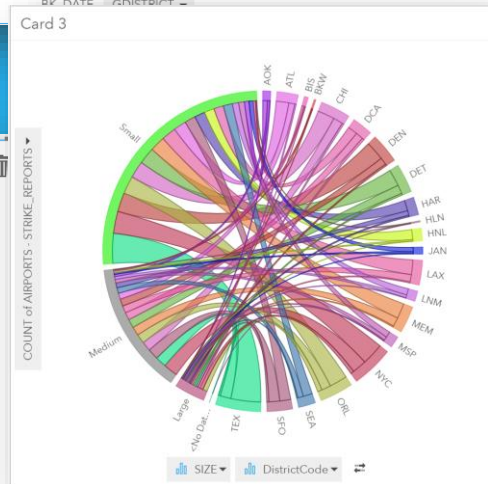
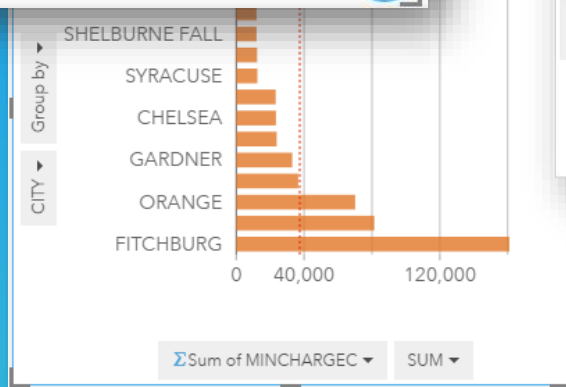
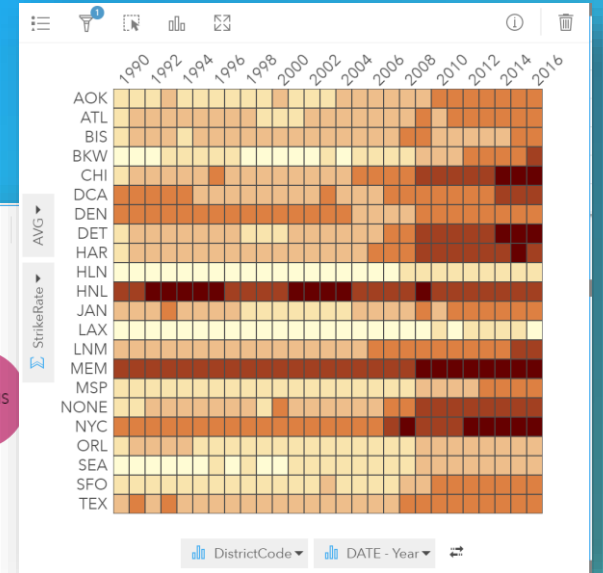
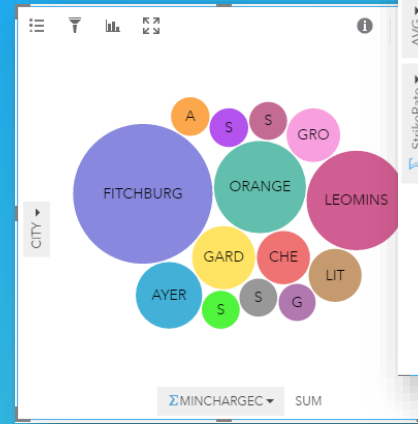
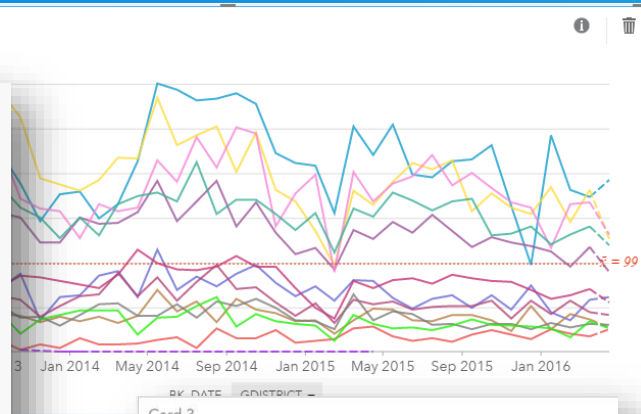
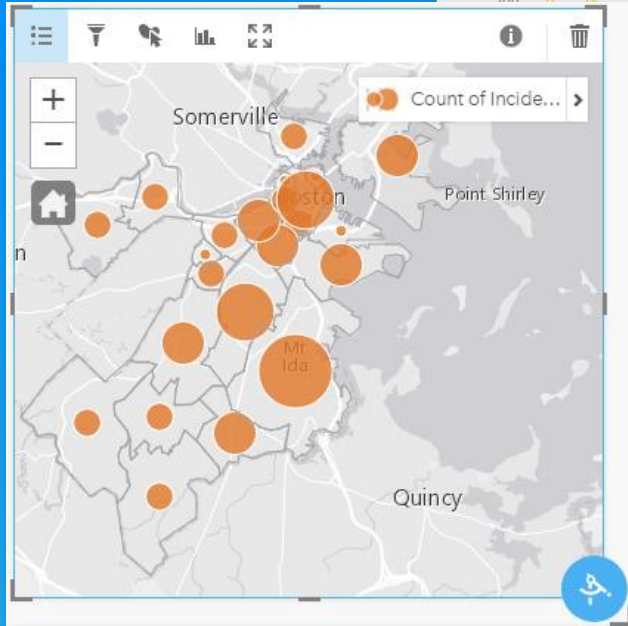


Analysis: Action Button, starts with questions



Results of Analytic Operations are expressed in Cards

Visualizations



Sharing

- **Workbooks, Pages, Cards, Workflow Templates**
 - Insights Viewer
 - Portal Items
- **Result Datasets as Feature Layers**
- **Insights Pages can be embedded in [Story Maps](#)**



Share Page

Title
USA Counties Population

Description
Enter a description for this item

Tags
insights × USA ×
Population ×
Add tag(s)

Share with:
 Everyone (public)
 Insights for ArcGIS evaluation
 These groups:
No groups available to share with.

Cancel Share



Insights

Workbooks

New workbook

Search

All workbooks

Date: Newest

SHARED

Untitled Workbook
ahaddad

01/16/2017

SHARED

Test SQL Server 2008
tester

01/16/2017

SHARED

Untitled Workbook
tester

01/16/2017

SHARED

RCS Workbook
tester

01/16/2017

SHARED

FL Test SAP HANA Cert
tester

01/16/2017

SHARED

Test SAP HANA
tester

01/14/2017

Demo

Behind the scenes



Insights “Stack”

Web
Browser



Modern Web Browser
- Supports IE11/Edge, Chrome,
Safari, Firefox

Portal



Insights and Insights Items live here
• Workbooks, Page, Models

Server



Insights Services / Other Engines

Relational
Data Store



Hosted Relational Data Store
• Insights Schema
• Insights Workspace

Connections to database

Require Server with correct JDBC Drivers

Database	Supported drivers
Microsoft SQL Server	Microsoft JDBC Driver for SQL Server version 4.0 and up. Install one of the following: <ul style="list-style-type: none">• sqljdbc4.jar• sqljdbc41.jar• sqljdbc42.jar
SAP HANA	SAP HANA JDBC Driver. Install: <ul style="list-style-type: none">• ngdbc.jar
Terradata	
Others	<ul style="list-style-type: none">• Extensible through Prof Svcs

Things to think about when deploying on-premises...

- **There is no magic bullet**
 - Performance is based on the weakest link
- **System sizing and scalability**
 - Should be done properly and even more so given the data intensive nature of Insights
 - More...
- **Size of data**
 - No “little” data



How to Get Insights

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.

Online or Enterprise



SaaS
ArcGIS Online

OR



Your Infrastructure
(Physical, Virtual, or Cloud)
ArcGIS Enterprise

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)

ArcGIS Enterprise

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

Licensing



- **Insights for ArcGIS Online**
 - Includes 1,000 credits / license
 - Yearly (term) license
- **Insights for ArcGIS Enterprise**
 - Yearly (term) license OR or perpetual (up front fee for indefinite time)
- **EAs** (enterprise agreements) often include Insights licenses, based EA size. See your account manager for details.
- All Esri **Partners** have Insights licenses.

Licensing

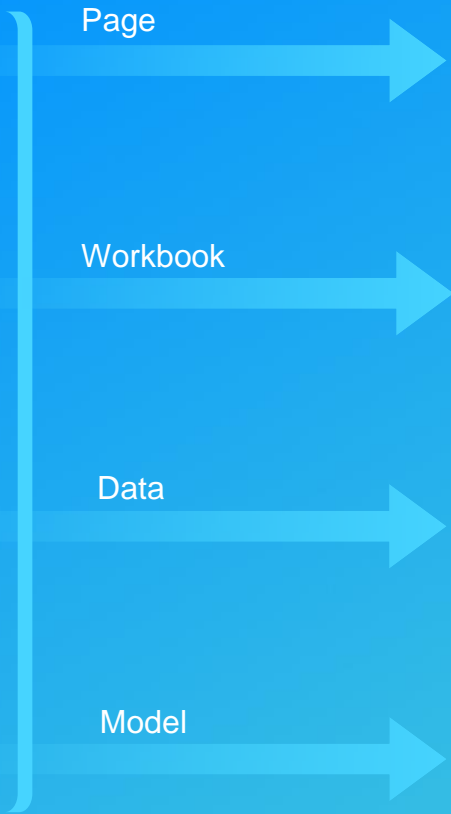


- Level 2 user + Insights license
- Level 1 user = Read only with shared items
- For the ability to create and edit workbooks, Insights requires a level 2 named user plus an Insights license.
- For viewing only, it is available to named ArcGIS users, including Level 1.

Sharing



Insights Analyst



Page 1 +

- Duplicate Page
- Delete Page
- Print Page
- Share As Model...**
- Share Page...**
- Refresh page

311.Calls

- Enable Location
- View Data Table
- Remove Dataset
- Hide Selected Fields
- Show Hidden Fields
- Share Data**

	CASE ID
	SOURCE
	DEPARTMENT
	WORK GROUP
	REQUEST TYPE
	CATEGORY

Open in Insights

Share

Item Information Learn more

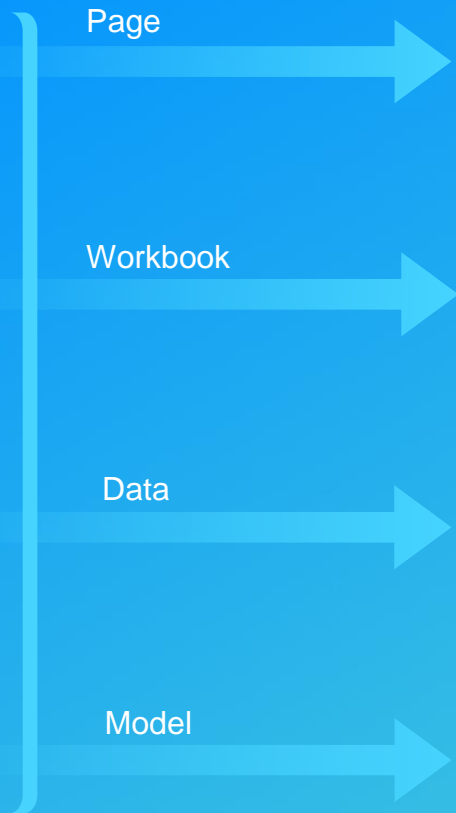
Low High

Top Improvement: [Add a summary](#)

Sharing



Insights Analyst



Anonymous access



Public

- View **embedded shared page** within: story map, The Hub, web page
- Access through iframe only

Level 1 user, any role



Viewer

- View **shared page within the Insights viewer** (read only)
- Can not open shared workbook nor shared model

Level 2, publisher role, + Insights license



Analyst

- View shared page **or workbook within the Insights viewer** (read only)
- **Open shared model within Insights**
 - Add data, and re-run analysis
 - Understand documented workflow

**Be sure to share data that the page or model needs.*

**Today, public sharing is only available with Enterprise (not Online).*

**Must be owner of a workbook to open it within Insights and modify it*

**Shared pages and workbooks support interactions of the read-only viewer*

15 Minutes



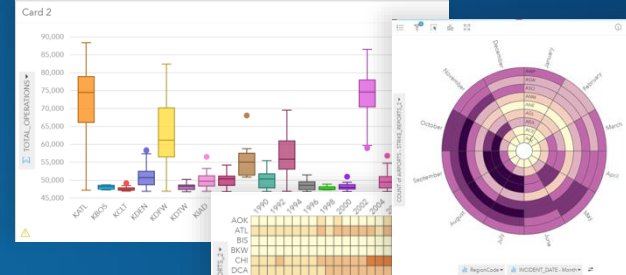
Insights as a capability within ArcGIS



Insights | Data Analytics Powered By Location

- Self-service analysis
- Explore both spatial and non-spatial data
- Find answers, drive impactful decisions

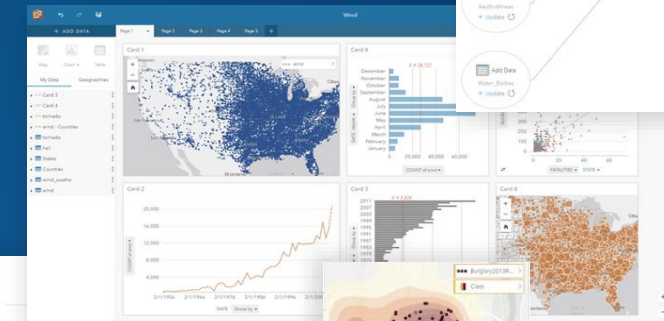
Quickly Breakdown Your Data



Repeat & Share Analysis



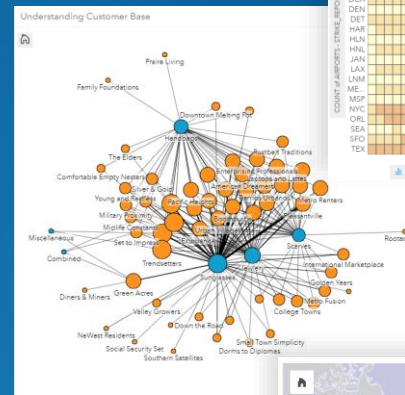
Linked & Responsive Cards



Spreadsheet

Database

GIS



Access Data from Across your Organization

Empower the Analyst

*Now in ArcGIS Online

Putting Insights to Work



Retail

Analyze patterns in sales performance based on proximity to store and area demographics.



Banking

Conduct deposit, branch performance, and investment analysis by location.



Law Enforcement

Identify crime patterns and manage operational accountability processes.



Petroleum

Perform acreage analysis and manage the portfolio to improve exploration and production.



Health and Human Services

Analyze access to care, model what-if scenarios, and meet community health needs.



Local Government

Look at budget and human resource allocation to identify issues and find efficiencies across different regions.



Electric and Gas

Monitor system and asset performance and mine data from real-time sensors.



Insurance

Perform portfolio and claims analysis and understand spatial patterns over time.

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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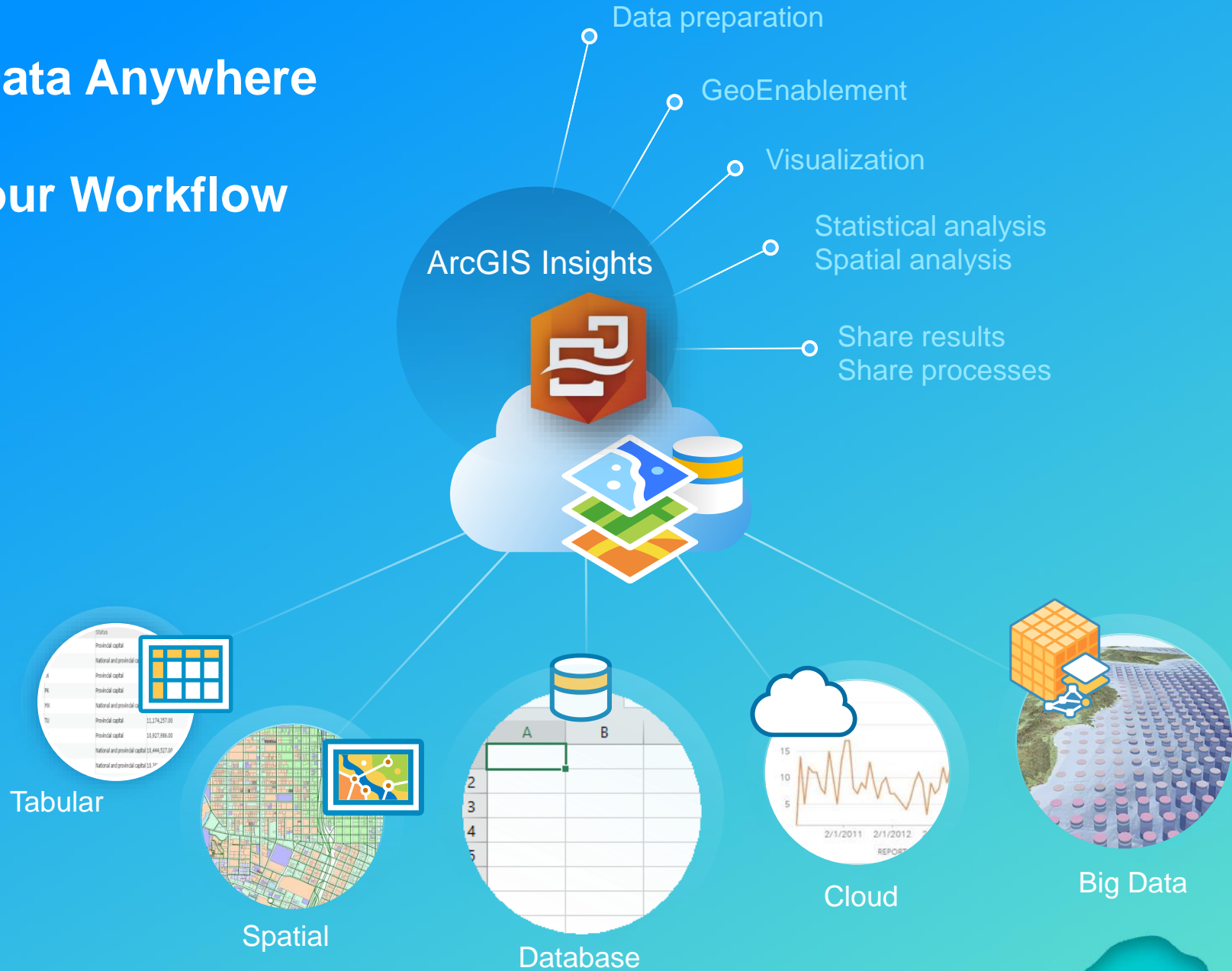


Empower everyone to easily discover, use, make, and share geographic information

Access Data Anywhere



Access Data Anywhere & Follow Your Workflow



Analytic Workflows, With Deeper Insight



Empowering the Analyst and Scientist

When should I use Insights?

GeoSpatial
Understanding



When should I use Insights?



ArcGIS
Map Viewer



Insights
for ArcGIS



ArcGIS
Pro



GeoSpatial Analysis Capability



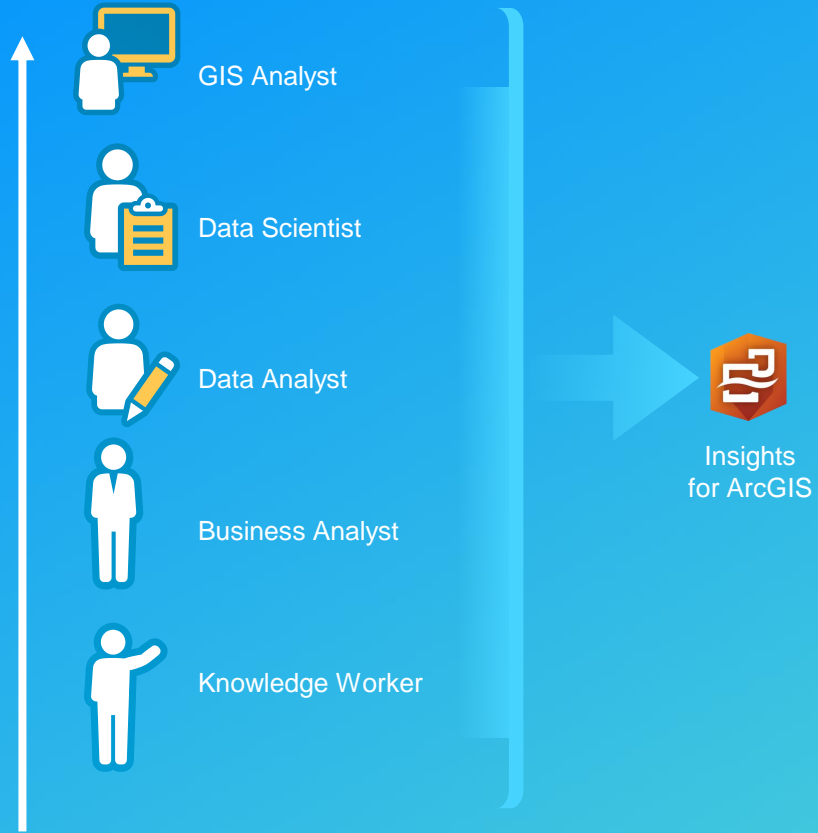
When should I use Insights?

Apps With Purpose



Usable Across Roles and Skill Levels

GeoSpatial
Understanding



Enabling People to Analyze Like Never Before

Take it to the next level of understanding

GeoSpatial
Understanding



Insights
for ArcGIS



When to Use What

Apps with a Purpose



Insights
for ArcGIS

- Data **analytics workbench**. Advanced analytics with drag-n-drop tools, minimal clicks. Visual and interactive results, share and re-run analysis.



ArcGIS Business
Analyst

- Specific **guided workflows** for **focused problems** (site selection, market planning, customer targeting...)



Operations
Dashboard
for ArcGIS

- Real-time data. Common **operating picture** for making informed decisions. **Monitor** events, activities, and situations.

Insights Within the Platform

Working Together Across ArcGIS

- Workflows may benefit from (or require) multiple apps or users
- Different skillsets and roles.



ArcGIS
Pro

- Preprocess and format data
- Perform custom analysis before OR after using Insights
 - Pro → Insights
 - Insights → Pro



Esri
Story Maps



ArcGIS
Hub

- Share and distribute analysis results, with context and meaning.



ArcGIS
Enterprise



ArcGIS
Online

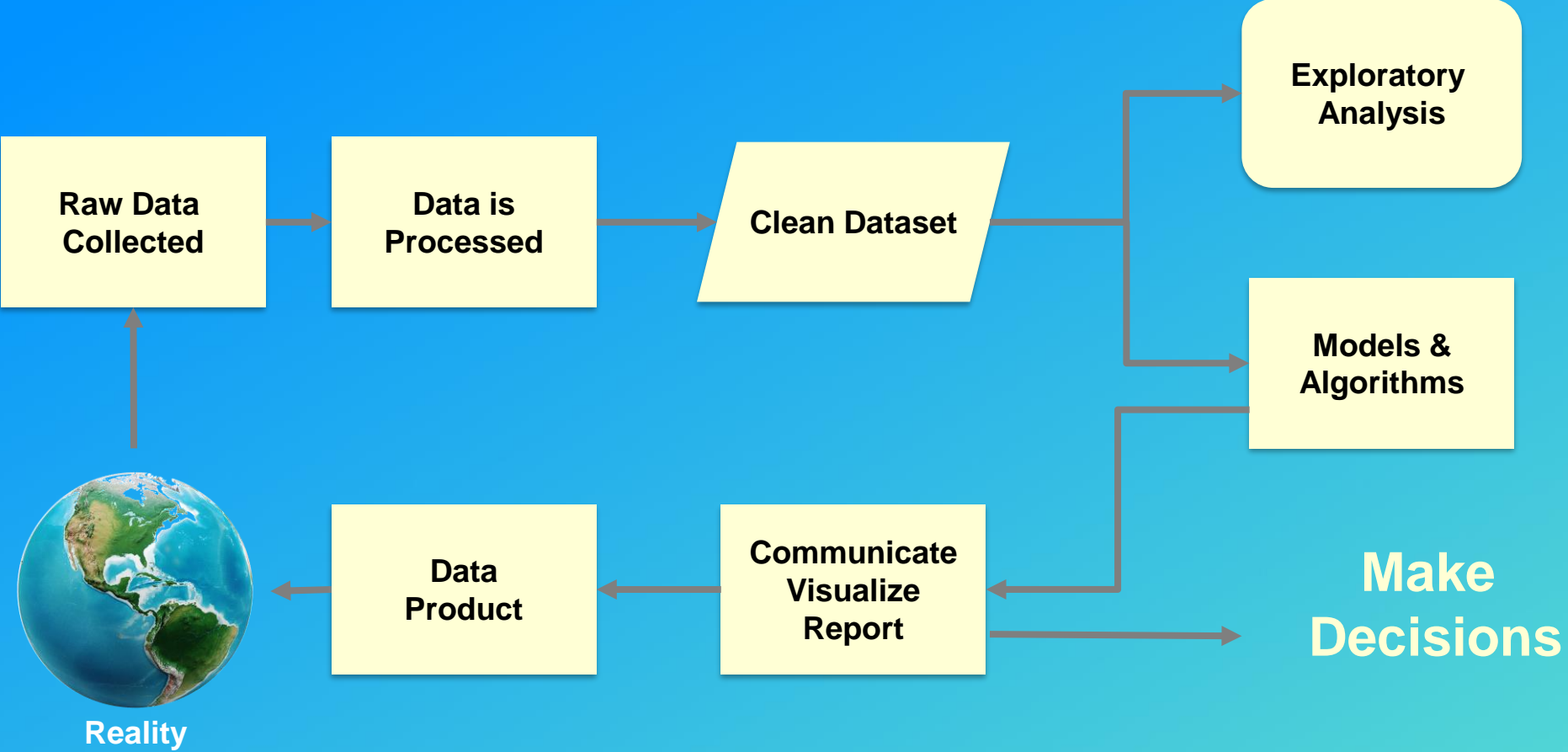
- Access organizational data that's managed and maintained

Multiple Apps and Products, Working Together as One

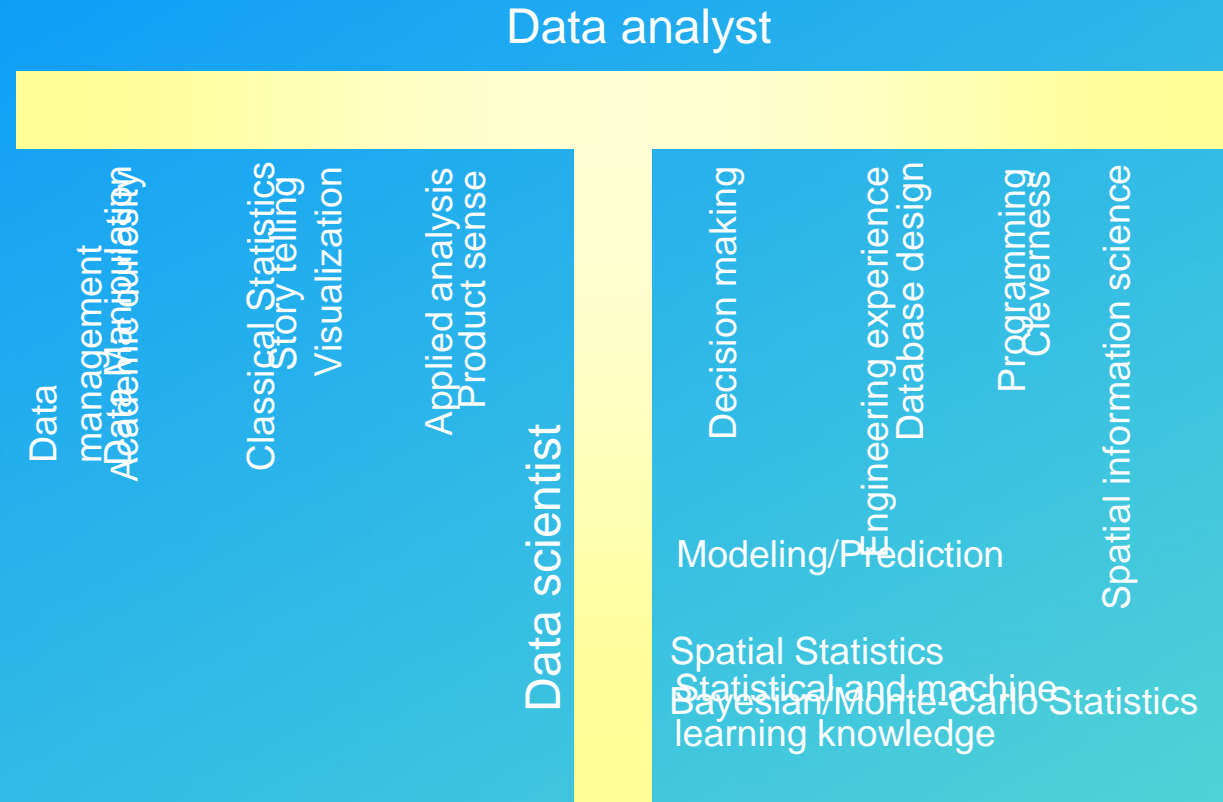


Using Insights for Analysis

A Data Science Process



Data analyst, data scientist & GIS professional



T-shaped professionals can more easily work in interdisciplinary teams than those with less breadth and can be more effective than those without depth.

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

Therefore, a data analyst gathers, arranges, processes and models data. They are able to analyze large volume of data, be it structured or unstructured.

The main objective of data analysis is to prepare and present data in the right form (graphs or tables) for decision-making and problem-solving process.

Maps,



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

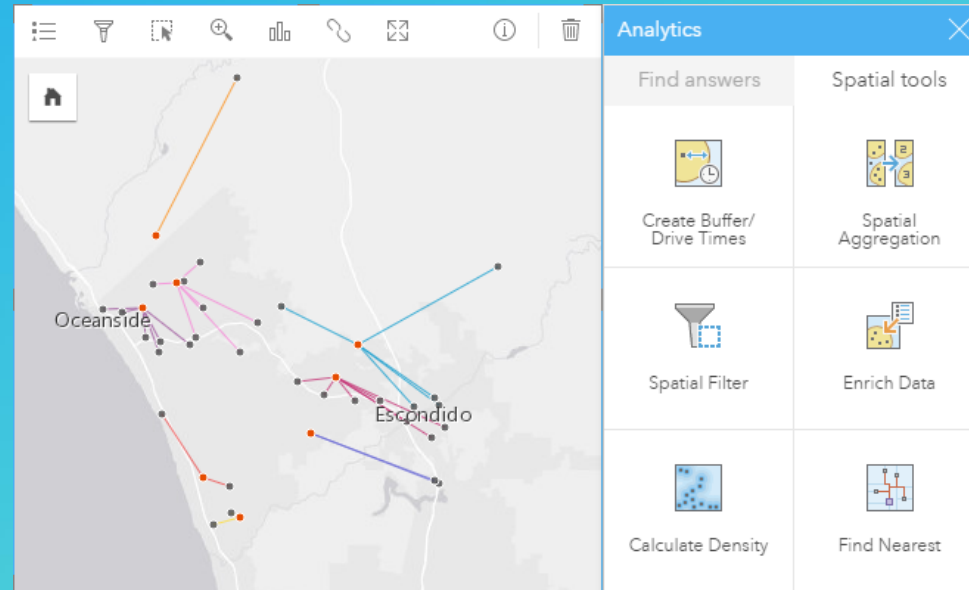
The screenshot displays a data visualization interface with several panels:

- Filter by Total:** A bar chart showing data distribution with a slider below it.
- Filter by City:** A list of cities with checkboxes and counts. The list includes: Select All (count 1), ALAMEDA (1), ALHAMBRA (1), ANAHEIM (3), ANTIOCH (1), APPLE VALLEY (1), ARCADIA (1), ARROYO GRANDE (1), AUBURN (1), BAKERSFIELD (3), BANNING (1), and BERKELEY (1).
- Line Chart:** A line graph showing 'ehistory_1980_2013_all_Legegencies' over time from 2/1/1981 to 2/1/2011. The y-axis ranges from 8,000 to 24,000.
- Filter by STARTDATED - Year:** A list of years from 1980 to 1988 with checkboxes and counts. The list includes: Select All (count), 213 (1), 1013 (1), 1980 (8710), 1981 (10077), 1982 (6065), 1983 (6237), 1984 (8921), 1985 (10189), 1986 (15275), 1987 (19213), and 1988 (19721).
- Layer Panel:** A list of layers including Location, GEOID, Id, FIPS, and Households.

Spatial Analysis Tools

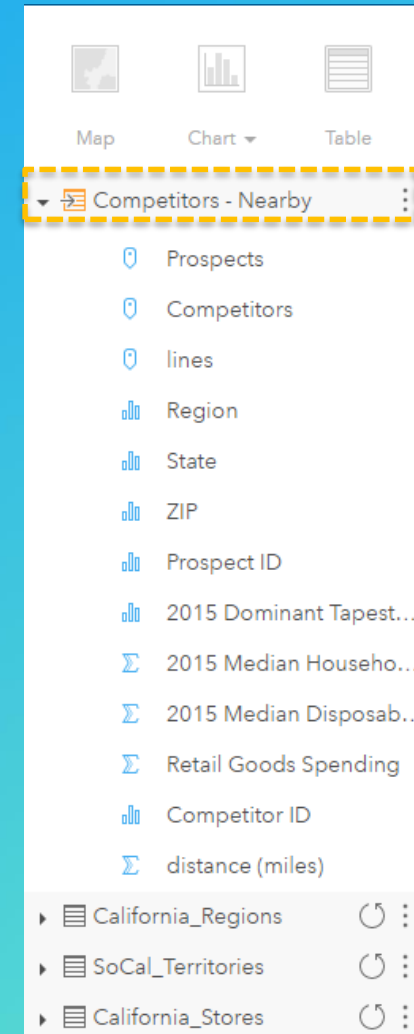
- Spatial aggregation
- Create buffer / drive times
 - Fixed distance (preview mode)
 - Drive time (by mode time / distance)
- Enrich data
- Calculate density
- Find Nearest

Overlapping / dissolved



Result layers

- **New temporary result layers are created:**
 - When the data takes a new form e.g. summary table, bar chart or spatial selection - fewer features with attributes
 - Analysis tool has been run
- **Result layers can be shared back to the portal**
- **Insights can use data with multiple shape fields e.g. find nearest**



Analysis view and models

- Analysis is recorded
 - Steps can be seen in the analysis view



- Models can be shared and input data updated

Card 1

Aggregate

Scatterplot

Trend Line

$y = 5.22E-5x^2 + 0.534x + 13,298$
 $R^2 = 0.973$

Replace Data

1 Choose Dataset

Provinces

2 Replace Fields

Original field

Establishm

Replacement field

Establishm

Original field

Total

Replacement field

Update Cancel

Year of land protection

Protected lands

VIETNA

CAMBODIA

Phnom Penh

ul of

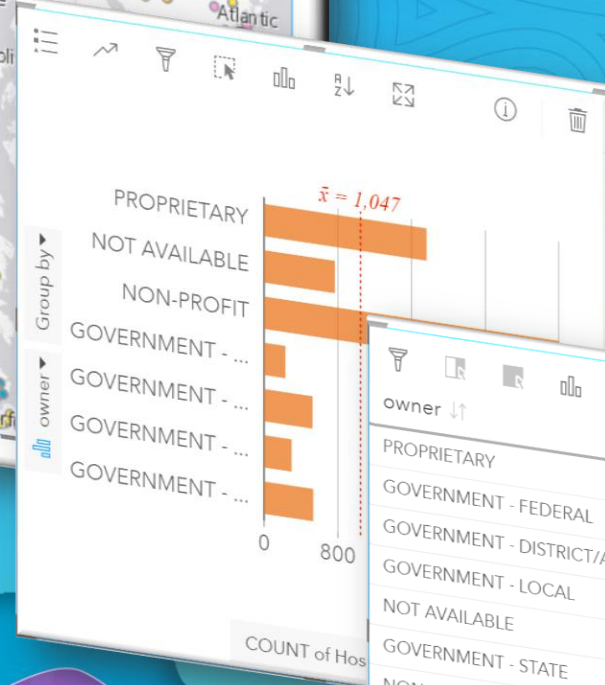
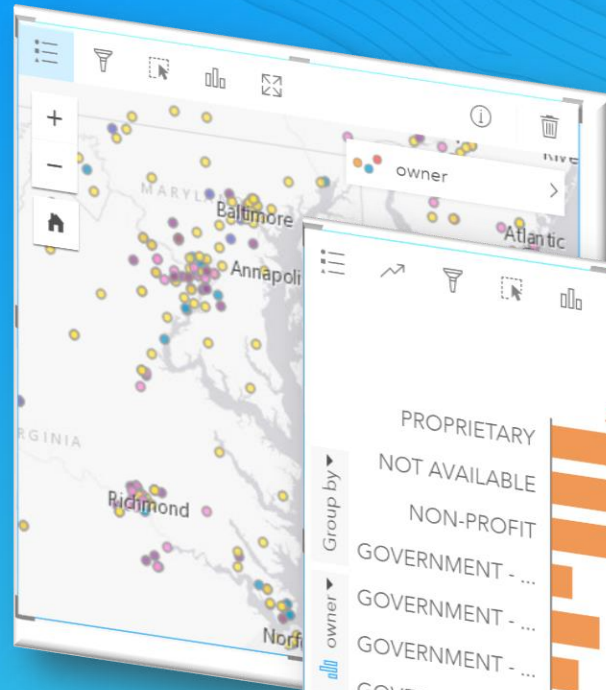
Add Data Provinces + Update

Add Data Protected_Area + Update

Add Data KeyBirdAreas + Update

Cards

SEEING YOUR DATA

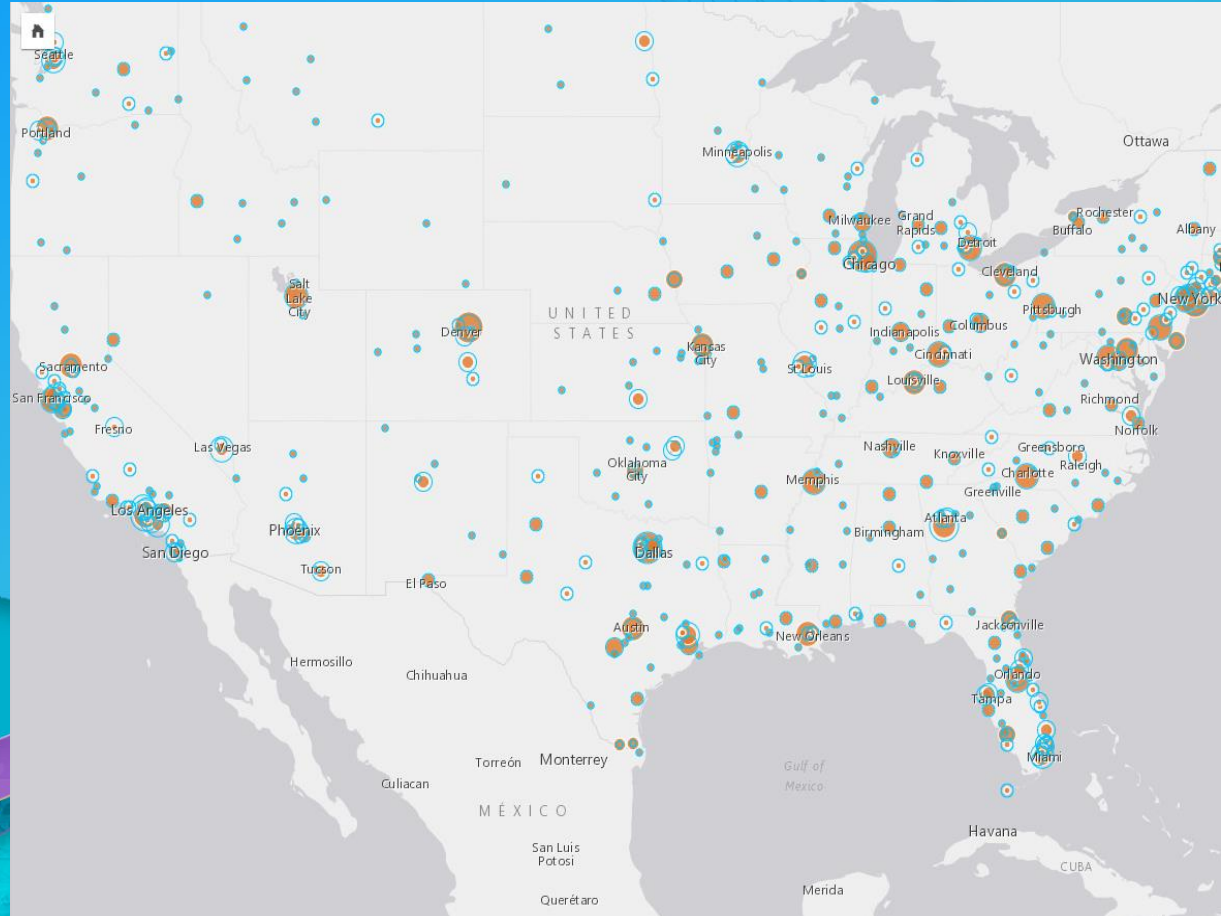


A table card showing the count of hospitals grouped by ownership type. The table has two columns: 'owner' and 'COUNT of Hospitals'. The total count is 7,331.

owner	COUNT of Hospitals
PROPRIETARY	1,765
GOVERNMENT - FEDERAL	300
GOVERNMENT - DISTRICT/AU...	533
GOVERNMENT - LOCAL	525
NOT AVAILABLE	768
GOVERNMENT - STATE	232
NON-PROFIT	3,208
Total 7,331	

Map Types

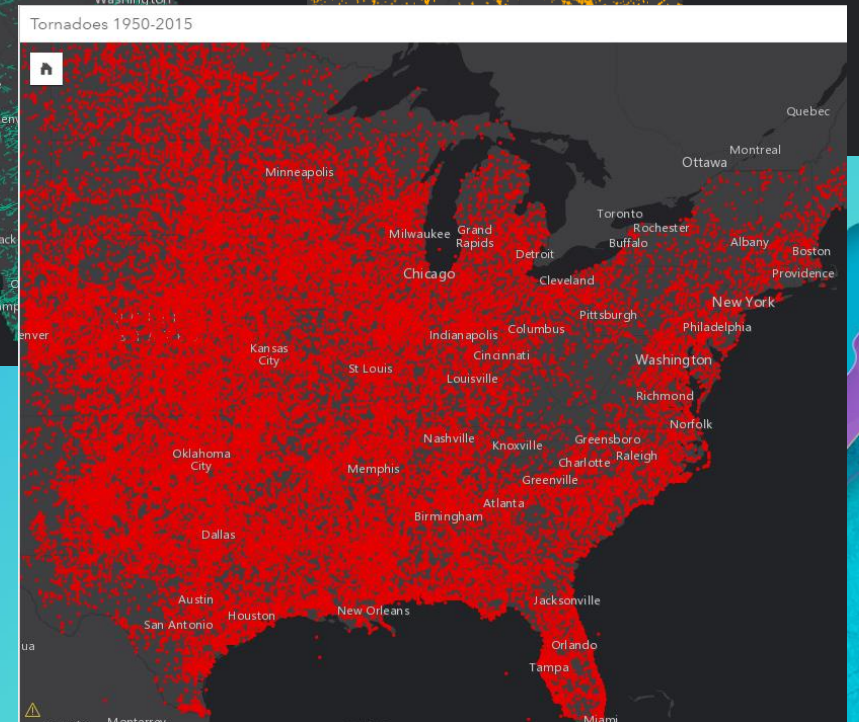
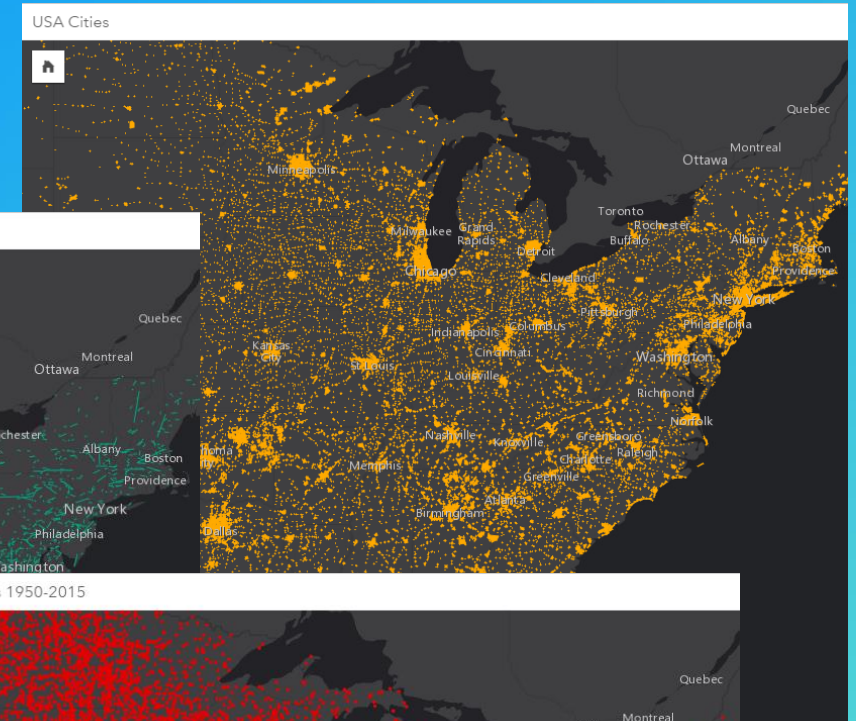
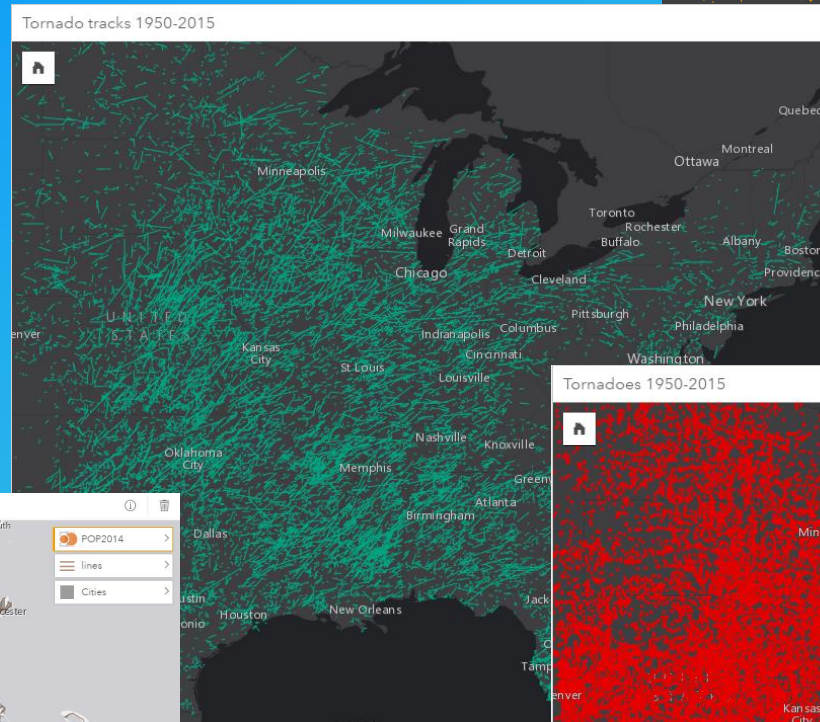
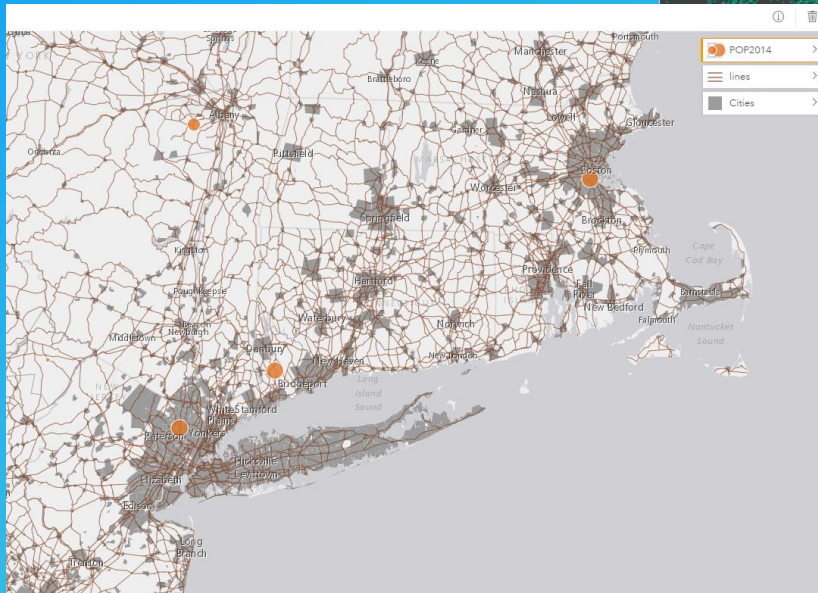
CHOICE MATTERS





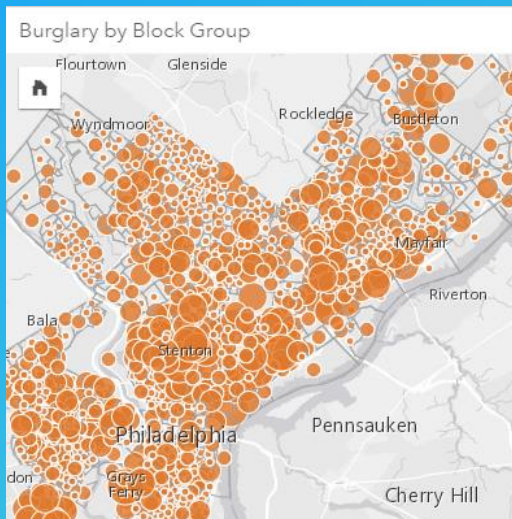
Map types

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

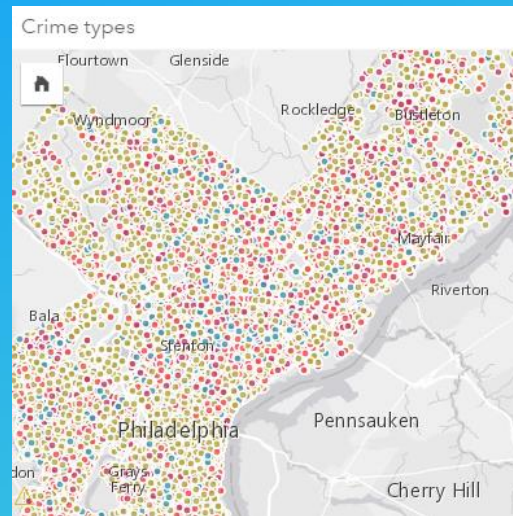


Map symbol types

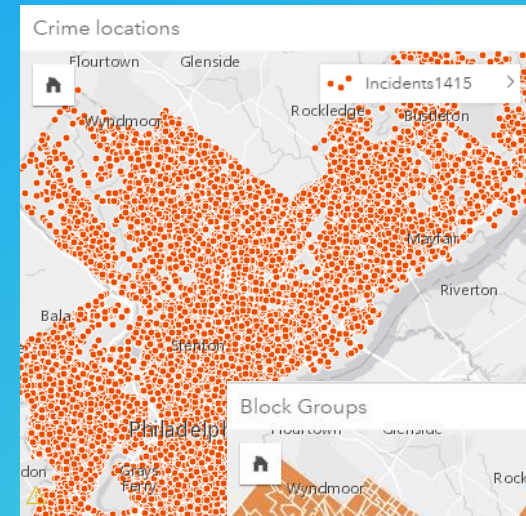
- Quantitative and qualitative options
 - Types (Unique symbols)
 - Locations (single symbol)
 - Original symbol
 - Counts and amounts (size) *
 - Counts and amounts (color)



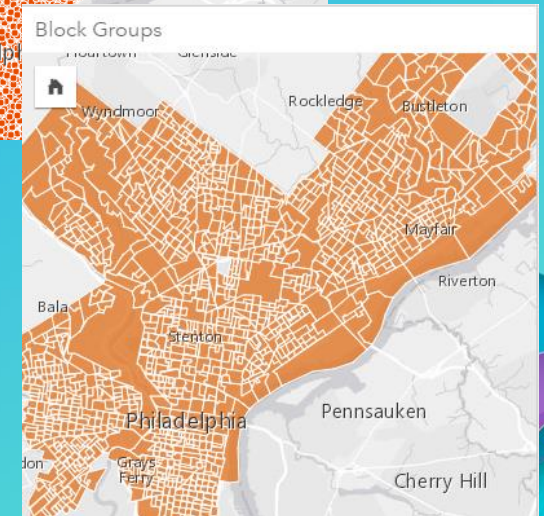
Counts and amounts (size)



Types



Locations



Choropleths

- Quantitative data – rates, ratios or percentages

⚠ Choropleth maps should show normalized values not counts collected over unequal areas or populations

- Using normalization (in GIS terminology) we can take into account the differences between the areas (e.g. size of area, population size etc)
- Normalization transforms measures of magnitude (counts or weights) into measures of intensity



Classification

- Quantitative data
- Classification is the method of grouping numeric data into ranges
- Classification methods include:
 - Natural Breaks *
 - Equal Interval
 - Quantile
 - Standard Deviation
 - Unclassed
 - Manual

⚠ Classification is important

* Default

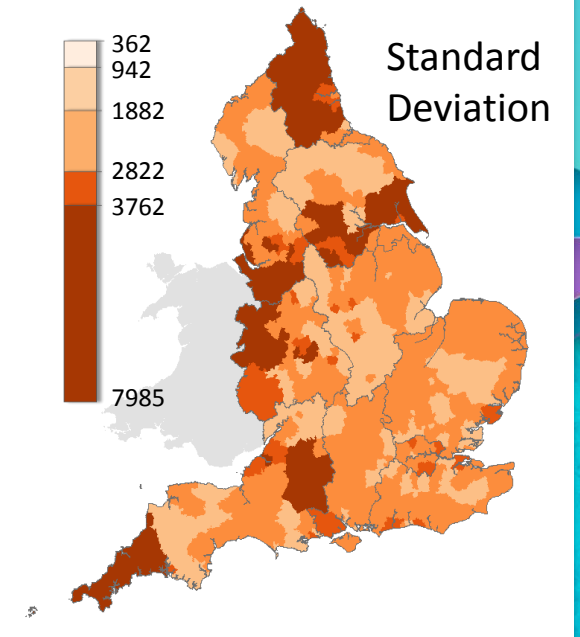
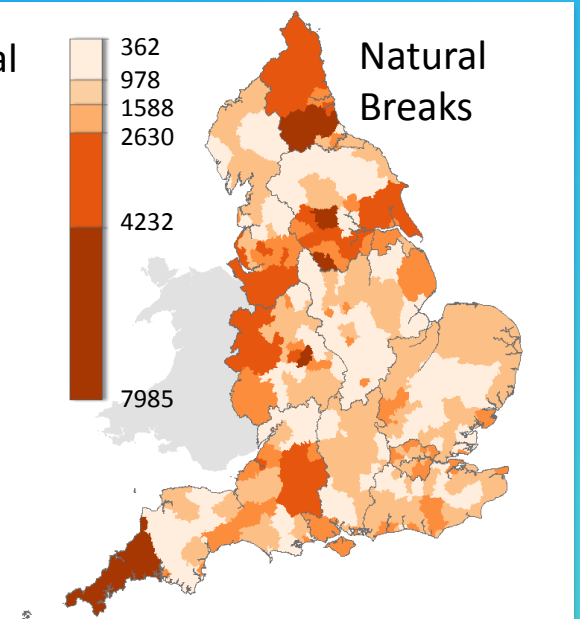
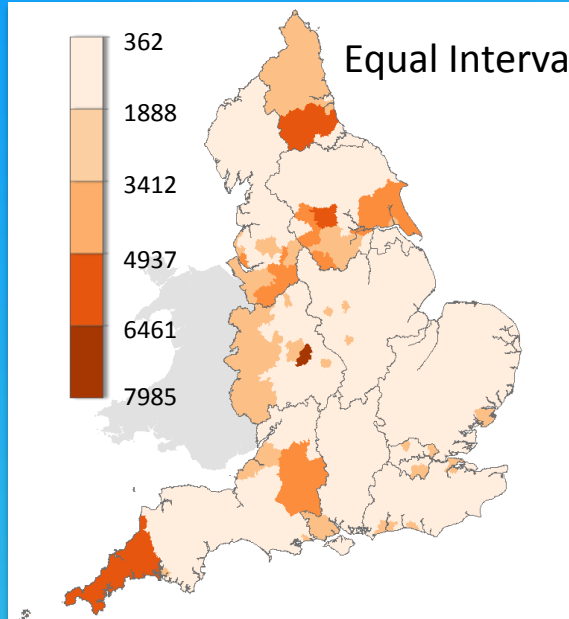
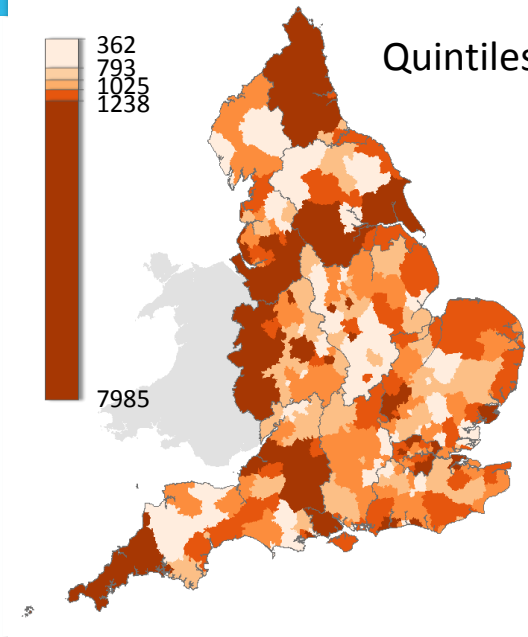
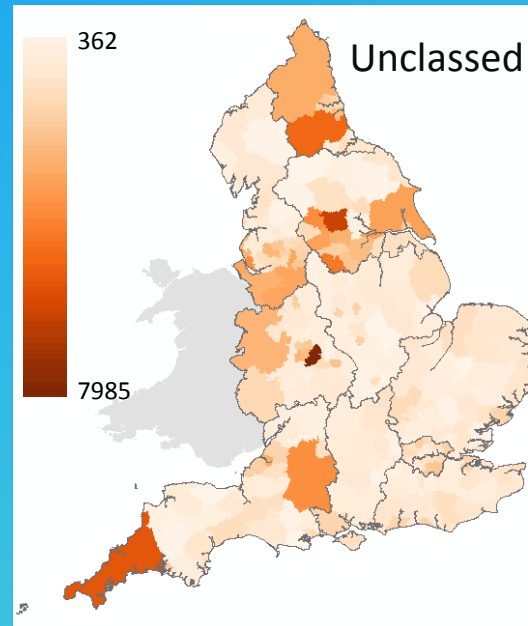
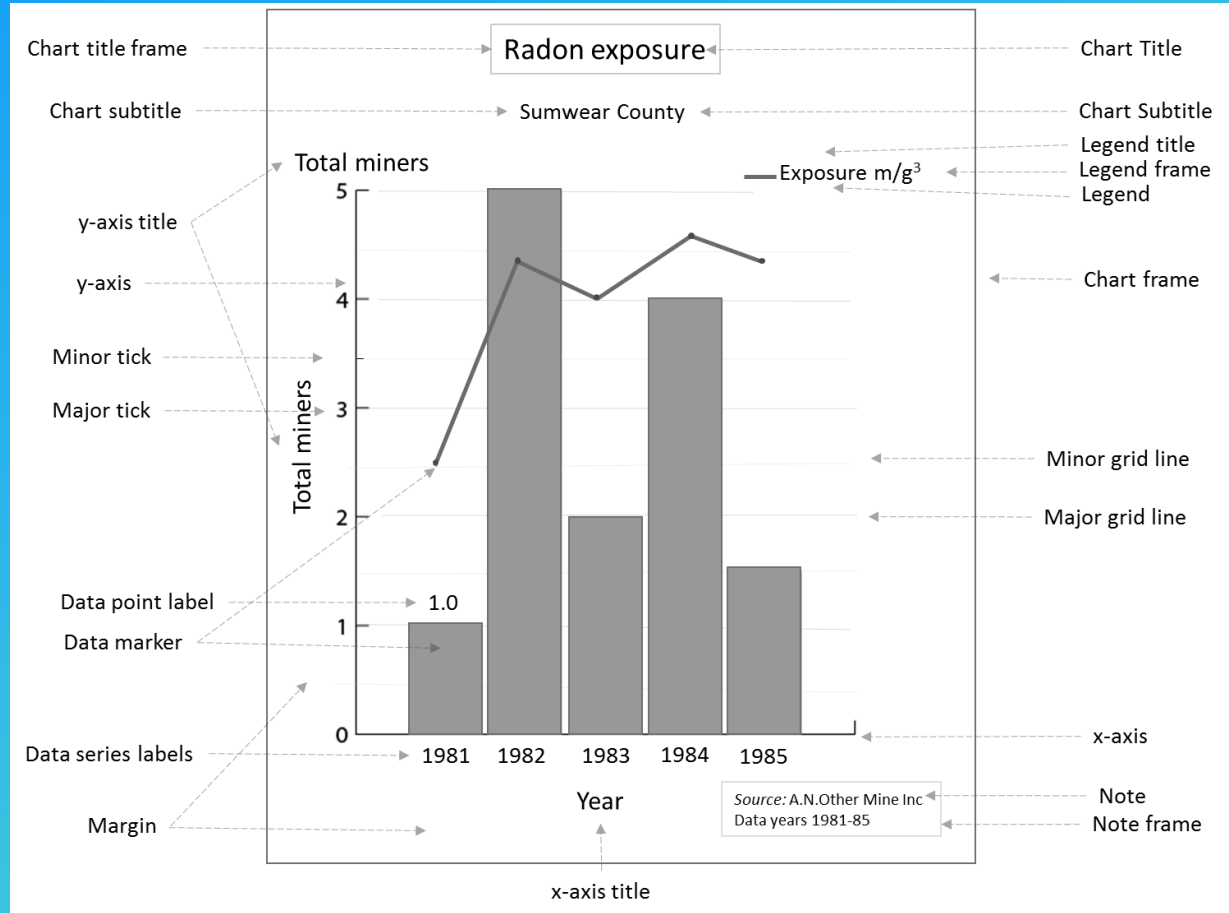


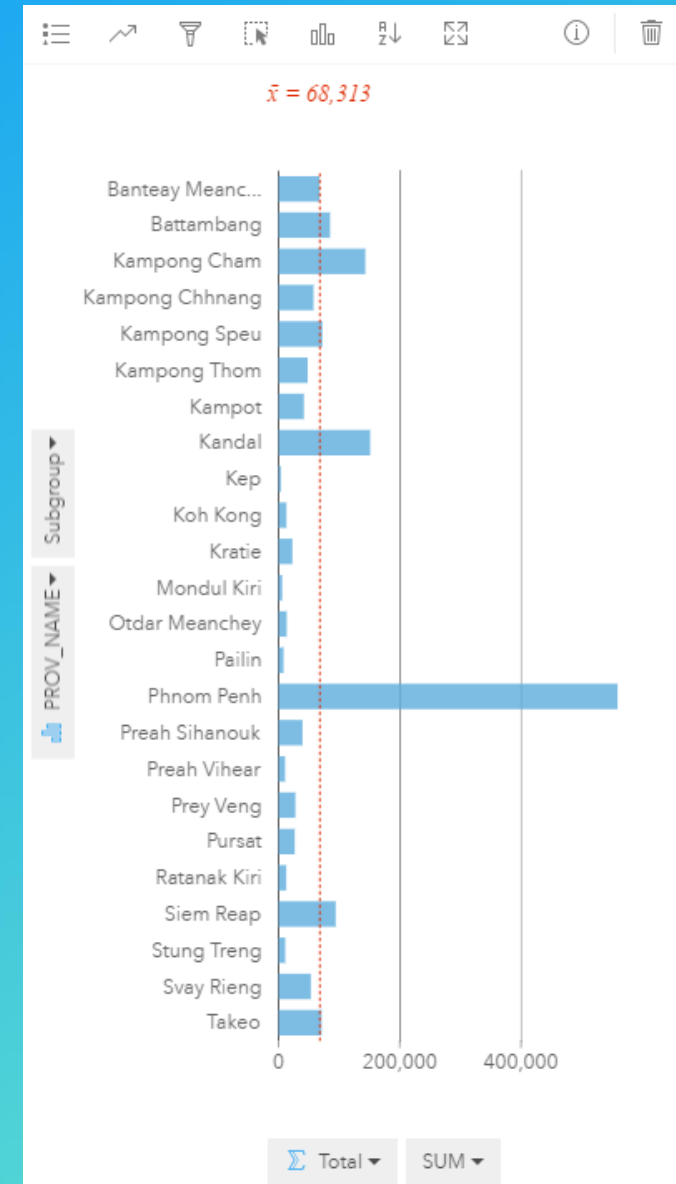
Chart types

WHAT TO USE WHEN



Bar graphs

- Qualitative data *
- Compare information, revealing highs and lows, trends
- A bar graph uses either horizontal or vertical bars to show comparisons among categories
 - Horizontal can be clearer if labels are long
- Along one axis the **categories** are plotted, and the other axis represents a **numerical** value
- They are useful for identifying broad differences between categories at a glance
- ⚠ Not effective with a large number of categories

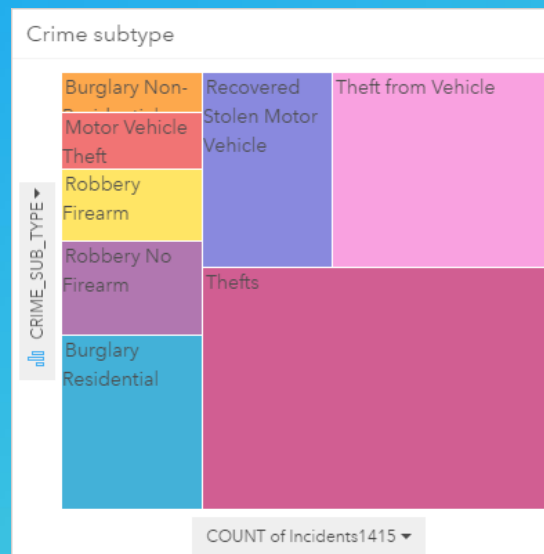


Grouped or Stacked Bar Graphs

- Grouped Bar Graphs: Two or more data series are plotted side-by-side and grouped together under categories, all on the same axis.
 - ⚠ With many bars in any group, they quickly become hard to read
- Stacked Bar Graphs: place the bars of multiple categories on top of each other to show how a larger category is divided into smaller categories and what the relationship of each part has on the total amount.
 - ⚠ Comparing segments to each other is problematic since they are not aligned.

Treemaps

- Show hierarchical data as a proportion of a whole and the structure of data
- The proportion of categories can easily be compared by their size
- ⚠ Not effective for revealing small differences

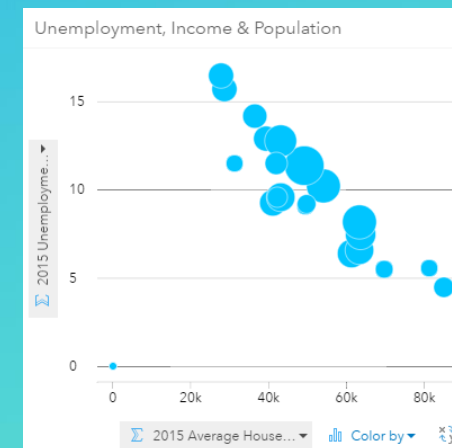
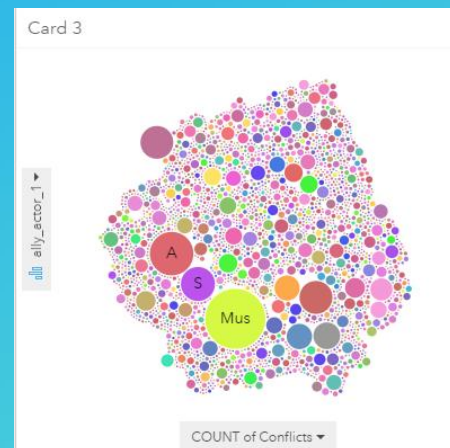
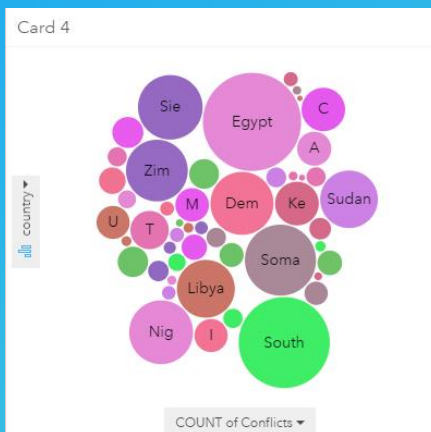




Bubble charts

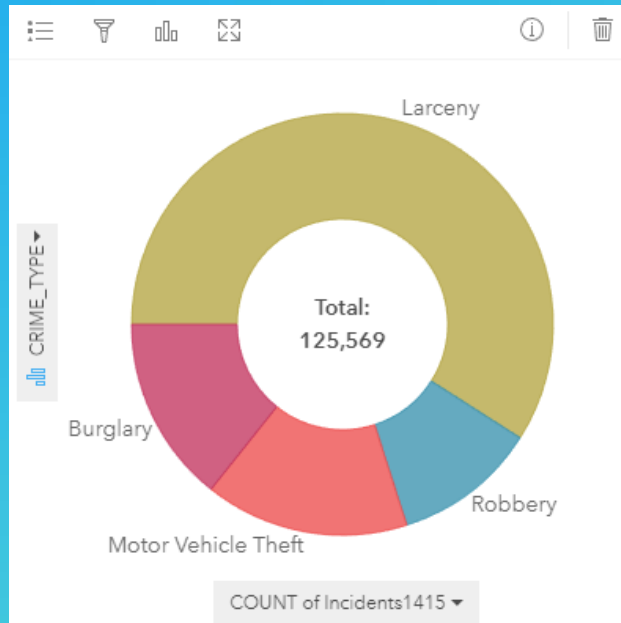
- Qualitative data or quantitative data

- Represent numerical values of variables by area in circles, randomly placed
- With two variables (e.g. category & count), the circles are placed so they are packed together
 - ⚠ Less perceptually accurate than bar charts (but allow hundreds of values to be visualized)
- If three variables are used (three numeric) then the circles are placed using Cartesian coordinates
 - ⚠ Hard to read with too many categories



Donut chart

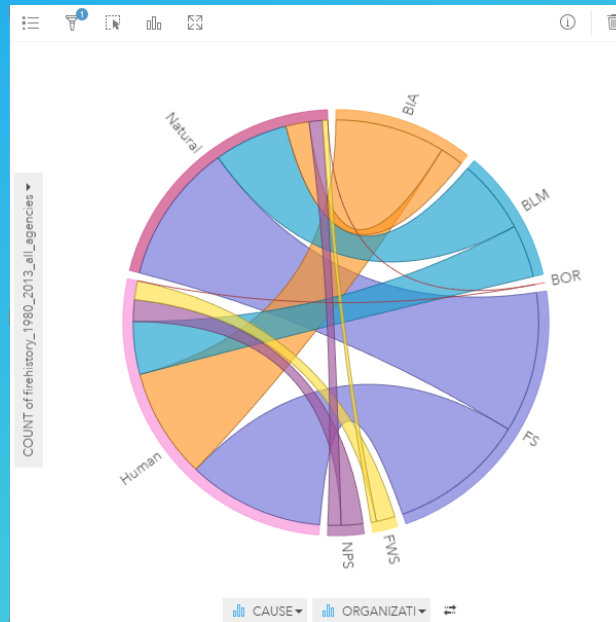
- Qualitative data
- Are used to show relative proportions or percentages of categories
- Ideally, donut charts should have at least three categories and no more than eight
- ⚠ The donut represents the whole so the data must constitute the whole





Chord diagram

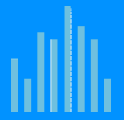
- Visualizes the inter-relationships between categories
- Allows comparison of similarities within a dataset or between different groups of data
- ⚠ With too many connections over-cluttering becomes a problem



Data clock

- Qualitative data
- A Data clock creates a circular chart of temporal data (stored as a qualitative variable)
- Commonly used to see the number of events at different periods of time
- ⚠ Remember data is classified; Can be hard to read with too many categories

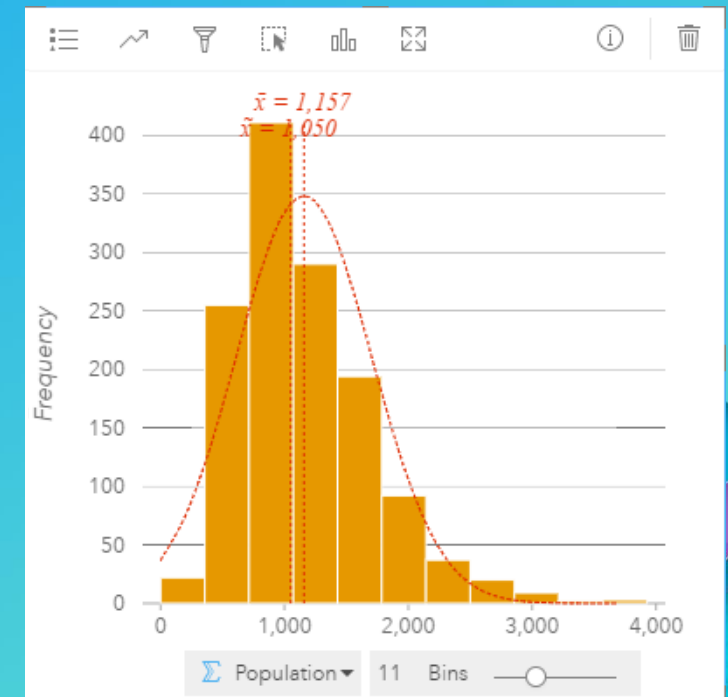




Histograms

- **Single quantitative field ***

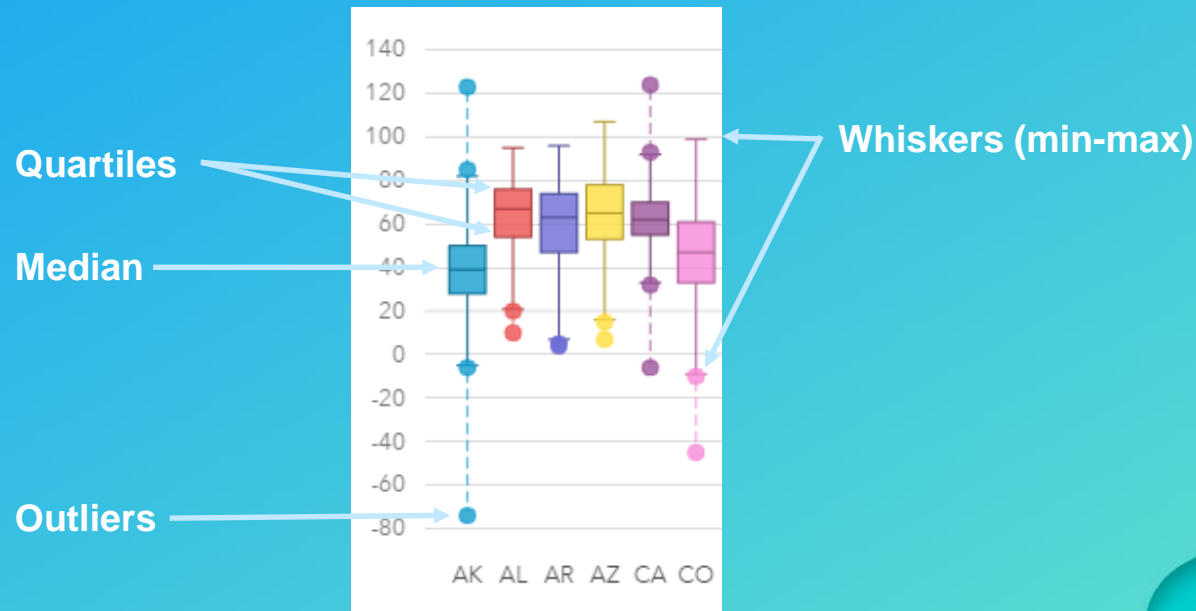
- Show the distribution of your data e.g. mean and median
- The numeric values are classified / binned
- The bar represents the range of the class bin, and the bar height represents the number of data points in the class bin
 - Statistics are reported: mean, median, standard deviation, skewness, kurtosis
 - The statistics are approximations (calculated on the classified data)
 - The normal distribution can be overlaid
- A dataset of the aggregated data is created





Box plot

- Shows the distribution of a set of a data, within one box with:
 - the median, upper and lower quartiles, minimum and maximum values, and any outliers
 - Useful for comparing distributions between many groups
- Data can be broken down by a category
 - side-by-side box plots are created, with each box plot representing the spread of data in each category





Scatterplots

- Allows you to look at relationships between two numeric variables (both scales and quantitative)
 - Independent / known on horizontal, dependent / modeled on vertical
 - Points can also be color-coded to increase the number of displayed variables to three
- If the data contain a large range of values, one or both axes can be converted to a log scale (log-normal and log-log)

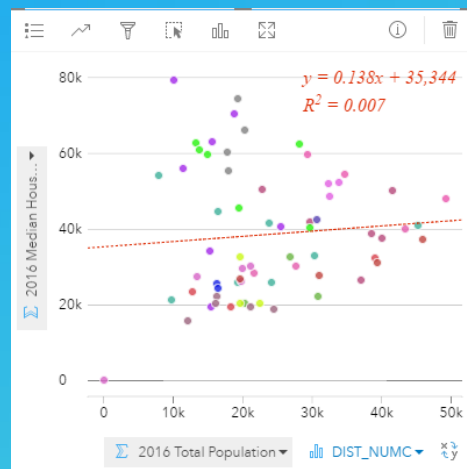
 Should be a logical reason for expecting a relationship



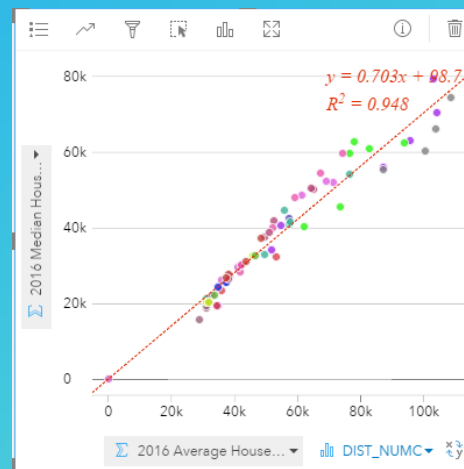
Scatterplot: Correlation

- Level of correlation can be quantified comparisons of two paired sets of measures to determine
 - Linear: as one set goes up the other set goes either up or down, equally.
 - Exponential: data values that rise or fall at constantly increasing rates. Data cannot contain zero or negative values.
 - Polynomial (2-4): when data fluctuates. The order of the polynomial is determined by the number of fluctuations.

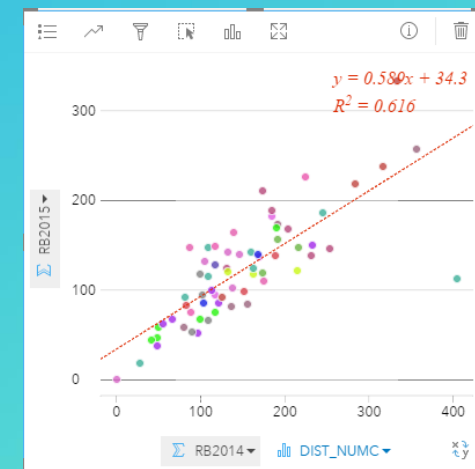
1. Strength
2. Direction
3. Type



No correlation



Good correlation

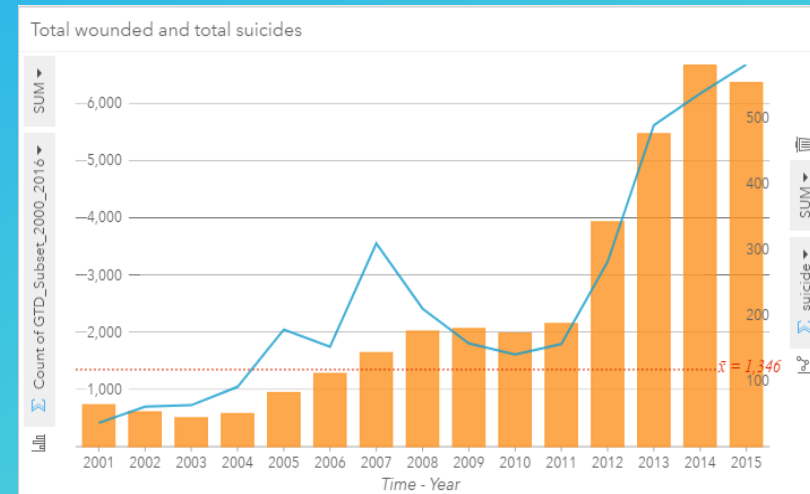
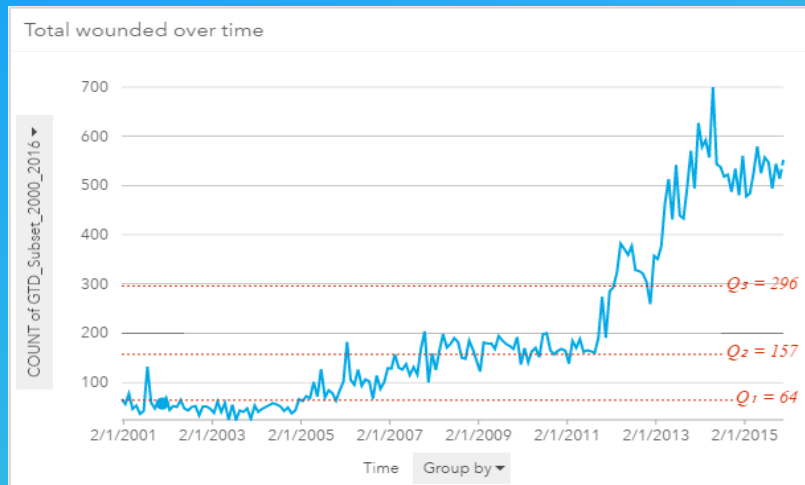


Positive



Time series/Line graph

- **Temporal data ***
 - Visualize a sequence of numeric values, primarily for trends over time
 - A line graph displays the relationship between two types of information by connecting individual numeric data points, showing the sequence of values
 - Good to highlight overall trends of values and change from one value to the next
- ⚠️ They should only be used with continuous variables





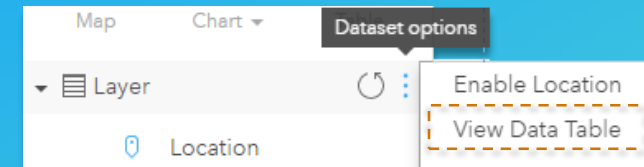
Summary Tables

- Qualitative and/or quantitative data
 - For analyzing data
 - Or exact values are important
 - Additional statistics can be calculated on numeric fields
 - sum, average, min, max
 - Information can be sorted
 - Selections can be inverted or just show selected
 - Can summarize data by up to two categories and n numeric fields
 - Data management with new result created
 - Can be joined to create new datasets

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

Data Table

- Attribute table
 - Access to see all the data in the dataset
 - Fields can be sorted ascending or descending
 - Switch selections or just show selected
 - Add and calculate fields
 - Functions can be accessed using the `fx` button
 - Four types are available: string (10), numeric (10), date (4), and logical (3)
 - Creates a join to the original data



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.

Hands-on

OPPORTUNITY TO USE INSIGHTS



Exercise #1

- <http://esriurl.com/13879>

ArcGIS Enterprise Documentation SEARCH Sign In English esri

Insights for ArcGIS

Home Use Administer

- Get started
 - What's new
 - Create your first workbook
 - Get started FAQ
 - Insightful tips
 - Access Insights
 - Publish data from ArcGIS Pro
 - Quick exercise**
 - ▶ Add and manage data
 - ▶ Map and visualize
 - ▶ Find answers with analytics
 - ▶ Share and collaborate
 - ▶ Reference

Quick exercise: Get started with Insights for ArcGIS

- Create a workbook and add data
- Questions
- Share your workflow and results
- Quiz answers

In this exercise, you are a business analyst for a consortium of colleges that wants to run a marketing campaign in states with high-value colleges. It's up to you to find states with colleges that have a good return on investment for students. You'll use Insights for ArcGIS to analyze United States Department of Education College Scorecard data in the form of a *feature layer* to find relationships between the cost of college and earnings by graduates. In 20 minutes or less, you will do the following:

- Visualize the data and results through interactive maps, charts, and tables.
- Interact, sort, filter, and update the visualizations on your page to ask more questions and find answers.
- Apply spatial analytics, such as spatial aggregation, to summarize data using area features.
- Share your page results and models with your colleagues so they can work on their campaigns.

Exercise #2

- <http://esriurl.com/13878>

Get Started with Insights for ArcGIS

Overview Lessons

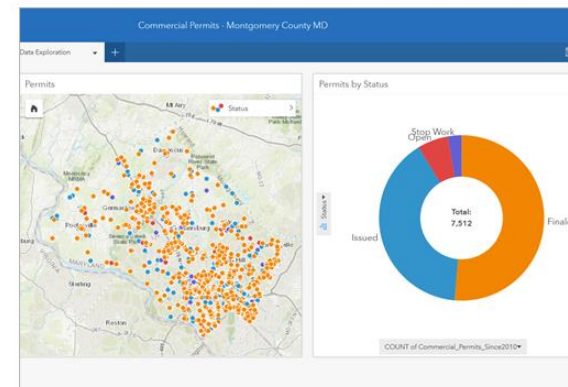
Overview

One indicator of a region's growth is the number of permits issued for new construction. Exploring and analyzing permit activity can help regional planners ensure that development occurs in accordance to the area's long-term goals. One area that has recently experienced rapid growth is Montgomery County, Maryland, a suburban county near Washington, D.C. County planners want to observe spatial and temporal growth trends, find out why certain areas are growing faster than others, and communicate key information about the county's growth to the public.

In these lessons, you'll explore Montgomery County permit data using Insights for ArcGIS, a web-based data analytics application. First, you'll create a new workbook and add the permit data from [ArcGIS Living Atlas of the World](#). You'll explore the data and become familiar with exactly what kind of information it contains. Then, you'll analyze the data to detect patterns and find out why growth is occurring. Once you've gathered your findings from your exploration and analysis, you'll share your work online.

Build skills in these areas:

- Adding data to a new workbook
- Visualizing data
- Performing aggregation and enrichment analyses
- Sharing your work

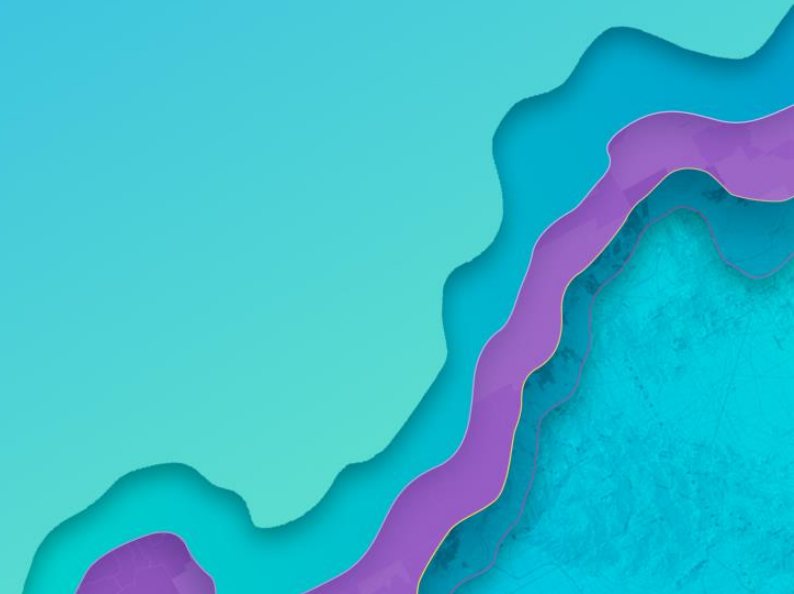


Road Ahead / Wrap Up



Almost done...

Q & A





esri

THE
SCIENCE
OF
WHERE

