



Insights: Top 5 Tips and Tricks

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GIS
INSPIRING
WHAT'S
NEXT

This presentation was delivered at the 2018 Esri User Conference

What is Insights for ArcGIS?



What is Insights?

What is Insights for ArcGIS?



Insights for ArcGIS is a web-based, data analytics workbench where you can explore spatial and non-spatial data, answer questions you didn't know to ask, and quickly deliver powerful results.

First, it is a web application, but it has features like undo, redo, and save that are more typical of a desktop application.

What is Insights for ArcGIS?



*Insights for ArcGIS is a web-based, **data analytics workbench** where you can explore spatial and non-spatial data, answer questions you didn't know to ask, and quickly deliver powerful results.*

It is a workbench where you graphically explore your data.

What is Insights for ArcGIS?



*Insights for ArcGIS is a web-based, data analytics workbench **where you can explore spatial and non-spatial data**, answer questions you didn't know to ask, and quickly deliver powerful results.*

It works with spatial data, but it also works with non-spatial tables.

What is Insights for ArcGIS?



*Insights for ArcGIS is a web-based, data analytics workbench where you can explore spatial and non-spatial data, **answer questions you didn't know to ask**, and quickly deliver powerful results.*

It is a data exploration tool, and it reveals patterns in the data that lead to questions that you may not have thought of.

What is Insights for ArcGIS?



*Insights for ArcGIS is a web-based, data analytics workbench where you can explore spatial and non-spatial data, answer questions you didn't know to ask, **and quickly deliver powerful results.***

Its interface is streamlined to help you quickly derive results, and the results are easy to share.

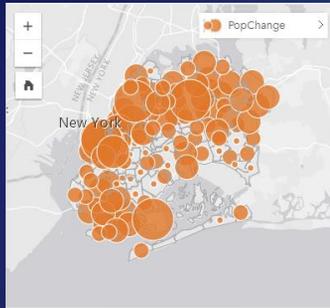
What is Insights for ArcGIS?



Insights for ArcGIS is a web-based, data analytics workbench where you can explore spatial and non-spatial data, answer questions you didn't know to ask, and quickly deliver powerful results.

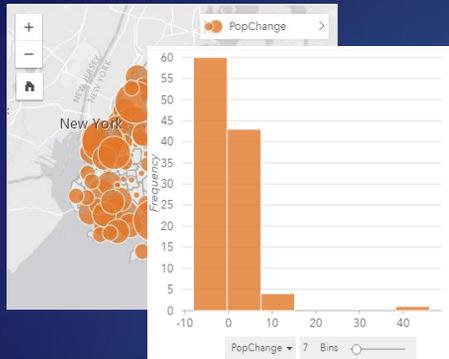
Insights for ArcGIS is a web-based, data analytics workbench where you can explore spatial and non-spatial data, answer questions you didn't know to ask, and quickly deliver powerful results.

What is Insights for ArcGIS?



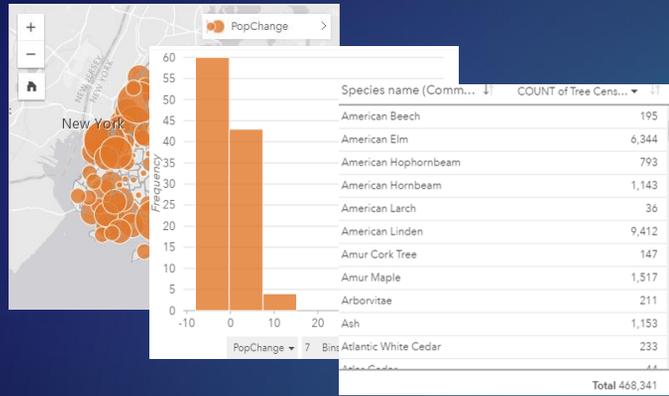
Drag and drop attributes to visualize them using map cards, ...

What is Insights for ArcGIS?



... chart cards,

What is Insights for ArcGIS?



... and summary table cards to quickly visualize your data in different ways.

How can I use Insights for ArcGIS?

Insights for ArcGIS is a web application.

How can I use Insights for ArcGIS?



ArcGIS Online

Use your web browser to connect to an ArcGIS Online portal in the cloud, ...

How can I use Insights for ArcGIS?



ArcGIS Online



ArcGIS Enterprise

... or connect to an ArcGIS Enterprise portal running on your own infrastructure, behind your firewall.

How is Insights for ArcGIS organized?



Workbook

An insights workbook contains all the components of an analysis project, keeping your work organized and your portal uncluttered.

How is Insights for ArcGIS organized?



Workbook



Pages



The workbook is organized into pages. Each page references the data needed for a line of inquiry.

How is Insights for ArcGIS organized?



Workbook



Pages



Cards in Page View

A page contains cards that help you explore the data to derive insights. You interact with the cards in page view.

How is Insights for ArcGIS organized?



Workbook



Pages



Cards in Analysis View

Use Analysis View to visualize the processes used to create the cards. Analysis view is also where you substitute different data for a page.

How do I share from Insights for ArcGIS?

- **Workbook**
- **Page in Page View**
- **Page in Analysis View**
- **Results layer**

Your insights can be shared in different ways, depending on what you want to do.

How do I share from Insights for ArcGIS?

- **Workbook**
- Page in Page View
- Page in Analysis View
- Results layer



If you share a workbook, it can be opened and explored by anyone it is shared to.

They can zoom, pan, select, and so on.

A user with an Insights license can duplicate the workbook and manipulate their own copy any way they want to.

How do I share from Insights for ArcGIS?

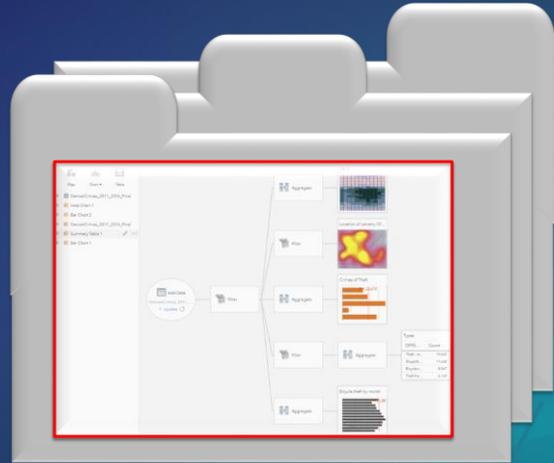
- Workbook
- **Page in Page View**
- Page in Analysis View
- Results layer



If you share a page in Page View, it can be embedded in story maps or other applications. You cannot directly share a card, but you can share a page with only one card on it.

How do I share from Insights for ArcGIS?

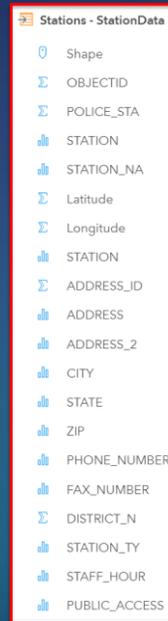
- Workbook
- Page in Page View
- **Page in Analysis View**
- Results layer



If you share a page in Analysis View, another Insights user can bring it into a workbook and substitute his or her own data into it.

How do I share from Insights for ArcGIS?

- Workbook
- Page in Page View
- Page in Analysis View
- **Results layer**



Share a results layer as a feature service to use it in applications other than Insights.

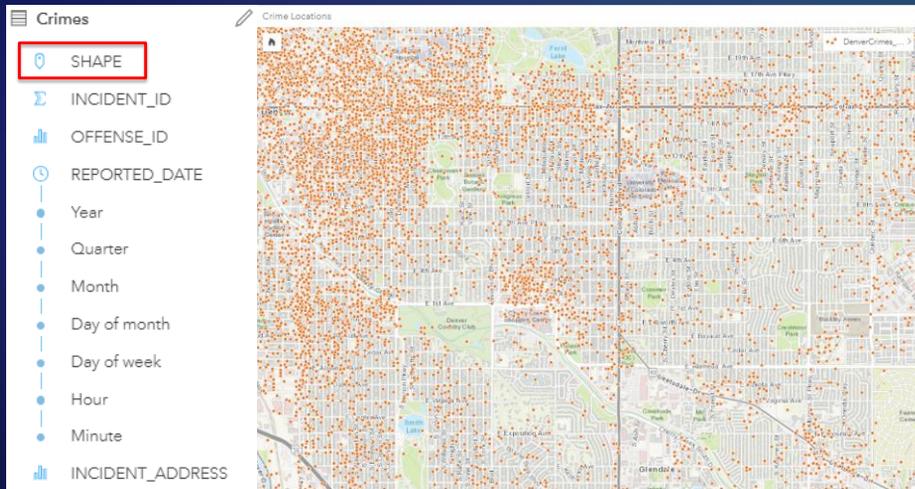
For example, you might use the feature service in ArcGIS Pro to take advantage of its advanced analysis tools, or you might want to display your results in one of the many available web applications.

What kinds of data does Insights for ArcGIS use?

Crimes															
+	Field														
INCI...	OFF...	REP...	REP...	REP...	REP...	REP...	REP...	REP...	REP...	REP...	INCI...	GEO...	GEO...	GEO...	DIST...
20.126.008.747	201260087472...	2012	Q4	October	24	Wednesday	9 AM	56	10/24/2012, 0...	9079 E 23RD A...	3,173,663	1,698,882	-104.8824	39.7506	5
2.013.321.372	201332137223...	2013	Q3	July	12	Friday	1 AM	04	7/12/2013, 01...	3100 S SHERID...	3,125,925	1,663,633	-105.0528	39.6544	4
2.013.270.903	201327090323...	2013	Q2	June	15	Saturday	3 PM	48	6/15/2013, 15...	2660 N FEDER...	3,133,725	1,700,398	-105.0244	39.7554	1
2.013.369.791	201336979123...	2013	Q3	August	7	Wednesday	11 AM	34	8/7/2013, 11.3...	3240 N HUMB...	3,149,092	1,703,096	-104.9697	39.7626	2
201.336.981	201336981239...	2013	Q1	January	23	Wednesday	4 PM	45	1/23/2013, 16...	820 16TH ST	3,142,306	1,697,059	-104.9939	39.7461	6
2.013.369.836	201336983623...	2013	Q3	August	7	Wednesday	12 PM	08	8/7/2013, 12.0...	1233 W ALAM...	3,140,030	1,684,375	-105.0023	39.7114	4
2.013.369.859	201336985923...	2013	Q3	August	7	Wednesday	11 AM	22	8/7/2013, 11.2...	900 AURARIA ...	3,139,286	1,696,887	-105.0047	39.7457	1
20.126.008.672	201260086722...	2012	Q4	October	22	Monday	11 AM	42	10/22/2012, 1...	1960 WELTON ...	3,144,268	1,697,625	-104.9869	39.7477	6
20.126.008.681	201260086812...	2012	Q4	October	22	Monday	2 PM	06	10/22/2012, 1...	1660 N STEELE...	3,154,757	1,696,031	-104.9497	39.7431	2
20.126.008.684	201260086842...	2012	Q4	October	22	Monday	2 PM	57	10/22/2012, 1...	<No Data>	3,177,110	1,703,269	-104.87	39.7626	5
20.126.008.691	201260086912...	2012	Q4	October	22	Monday	6 PM	30	10/22/2012, 1...	1899 WYNKO...	3,141,164	1,700,192	-104.9979	39.7548	6
20.126.008.694	201260086942...	2012	Q4	October	22	Monday	7 PM	05	10/22/2012, 1...	1337 N STEEL...	3,154,769	1,693,997	-104.9497	39.7375	2
20.126.008.699	201260086992...	2012	Q4	October	22	Monday	7 PM	57	10/22/2012, 1...	1331 N SPEER ...	3,141,191	1,693,918	-104.998	39.7375	1
2.013.331.542	201333154223...	2013	Q3	July	17	Wednesday	5 PM	24	7/17/2013, 17...	27 S PEARL ST	3,146,107	1,686,093	-104.9806	39.716	3
2.013.331.609	201333160923...	2013	Q3	July	17	Wednesday	7 PM	25	7/17/2013, 19...	<No Data>	3,178,311	1,704,405	-104.8657	39.7657	5
2.013.227.284	201322728423...	2013	Q2	May	21	Tuesday	3 PM	16	5/21/2013, 15...	1700 BLOCK N...	3,150,576	1,696,122	-104.9465	39.7434	6
2.013.227.295	201322729523...	2013	Q2	May	21	Tuesday	5 PM	23	5/21/2013, 17...	<No Data>	3,157,310	1,676,542	-104.941	39.6896	3
2.013.227.360	201322736023...	2013	Q2	May	21	Tuesday	5 PM	42	5/21/2013, 17...	1000 N BROA...	3,144,274	1,692,036	-104.987	39.7323	6
2.013.227.495	201322749523...	2013	Q2	May	21	Tuesday	7 PM	02	5/21/2013, 19...	<No Data>	3,138,537	1,701,091	-105.0073	39.7573	1
2.013.279.115	201327911523...	2013	Q2	June	20	Thursday	8 AM	39	6/20/2013, 08...	4780 N ELIOT ST	3,133,888	1,710,451	-105.0234	39.7836	1
2.013.318.469	201331846923...	2013	Q3	July	10	Wednesday	3 PM	32	7/10/2013, 15...	4805 E EVANS ...	3,160,125	1,672,585	-104.9311	39.6787	3
2.013.262.348	201326234823...	2013	Q2	June	21	Friday	9 PM	54	6/21/2013, 21...	500 16TH ST	3,143,046	1,696,397	-104.9913	39.7443	6
2.013.267.799	201326779923...	2013	Q2	June	13	Thursday	8 PM	22	6/13/2013, 20...	5674 E GREEN...	3,162,708	1,664,014	-104.9221	39.6851	3
201.327.815	201327815230...	2013	Q1	January	18	Friday	3 AM	09	1/18/2013, 03...	2100 S HOLLY ...	3,162,728	1,672,411	-104.9219	39.6781	3
2.013.262.517	201326251723...	2013	Q2	June	21	Friday	11 PM	32	6/21/2013, 23...	<No Data>	3,169,237	1,705,800	-104.8979	39.6977	5

Insights uses tables from feature layers in your portal, CSV files, spreadsheets, and, for the ArcGIS Enterprise version of Insights, geodatabases and database connections. To use other sources of feature data, just publish them to your portal as feature services.

Location-enabled tables



Location enabled tables such as Feature Layers can be shown on map cards. Insights for ArcGIS can enable location on other tables if they have street address fields; XY coordinate fields; or fields containing county, zip code, census tract, or other geographic identifiers.

Join tables

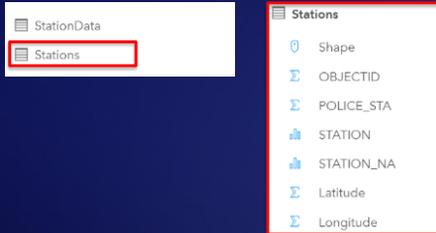


A screenshot of a software interface with a dark blue background. In the top left corner, the text 'Join tables' is displayed in white. Below it, a white rectangular box contains two entries, each with a small icon of a table and the text 'StationData' and 'Stations' respectively.

- StationData
- Stations

You can also use Insights to enable location by joining a non-spatial table to a location-enabled table.

Join tables



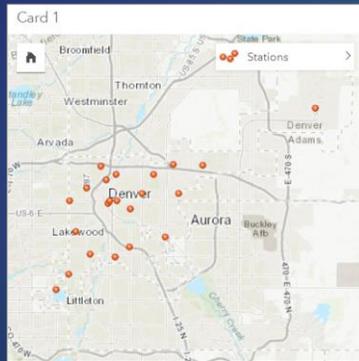
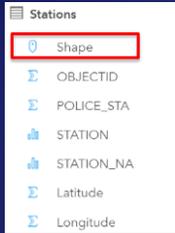
In this example, we have a location-enabled table called Stations.

Join tables

The screenshot shows a user interface for joining tables. On the left, a sidebar lists 'StationData' and 'Stations'. On the right, a dropdown menu for 'Stations' is open, listing several fields: 'Shape' (highlighted with a red box), 'OBJECTID', 'POLICE_STA', 'STATION', 'STATION_NA', 'Latitude', and 'Longitude'. Each field is preceded by a small icon representing its data type.

It has a location field ...

Join tables



... so it can be displayed on a map card.

Join tables

The screenshot displays three panels of data tables. The first panel on the left shows a list with 'StationData' and 'Stations', where 'StationData' is highlighted with a red border. The second panel in the middle, titled 'Stations', lists fields: Shape, OBJECTID, POLICE_STA, STATION, STATION_NA, Latitude, and Longitude. The third panel on the right, titled 'StationData', lists fields: STATION, STATION_NAME, ADDRESS_ID, ADDRESS, ADDRESS_2, CITY, STATE, ZIP, PHONE_NUMBER, FAX_NUMBER, DISTRICT_N, STATION_TY, STAFF_HOUR, and PUBLIC_ACCESS. This panel is also highlighted with a red border.

Table	Field
StationData (highlighted)	STATION
	STATION_NAME
Stations	OBJECTID
	POLICE_STA
	STATION
	STATION_NA
	Latitude
	Longitude
	Shape
StationData (highlighted)	ADDRESS_ID
	ADDRESS
	ADDRESS_2
	CITY
	STATE
	ZIP
	PHONE_NUMBER
	FAX_NUMBER
	DISTRICT_N
	STATION_TY
	STAFF_HOUR
	PUBLIC_ACCESS

Another table, called StationData, has many useful attributes, but no location field. So it cannot be displayed on a map card.

Join tables

The image shows a data tool interface with three table schemas. The first schema, 'StationData', contains 'StationData' and 'Stations'. The second schema, 'Stations', contains 'Shape', 'OBJECTID', 'POLICE_STA', 'STATION', 'STATION_NA', 'Latitude', and 'Longitude'. The third schema, 'StationData', contains 'STATION', 'STATION_NAME', 'ADDRESS_ID', 'ADDRESS', 'ADDRESS_2', 'CITY', 'STATE', 'ZIP', 'PHONE_NUMBER', 'FAX_NUMBER', 'DISTRICT_N', 'STATION_TY', 'STAFF_HOUR', and 'PUBLIC_ACCESS'. The 'STATION_NAME' field in the third schema is highlighted with a red box.

Table	Field
StationData	StationData
StationData	Stations
Stations	Shape
Stations	OBJECTID
Stations	POLICE_STA
Stations	STATION
Stations	STATION_NA
Stations	Latitude
Stations	Longitude
StationData	STATION
StationData	STATION_NAME
StationData	ADDRESS_ID
StationData	ADDRESS
StationData	ADDRESS_2
StationData	CITY
StationData	STATE
StationData	ZIP
StationData	PHONE_NUMBER
StationData	FAX_NUMBER
StationData	DISTRICT_N
StationData	STATION_TY
StationData	STAFF_HOUR
StationData	PUBLIC_ACCESS

The tables have matching fields. The field names may be different, but they contain identical station names.

Join tables

- StationData
- Stations

- Stations
 - Shape
 - OBJECTID
 - POLICE_STA
 - STATION
 - STATION_NA**
 - Latitude
 - Longitude

- StationData
 - STATION
 - STATION_NAME**
 - ADDRESS_ID
 - ADDRESS
 - ADDRESS_2
 - CITY
 - STATE
 - ZIP
 - PHONE_NUMBER
 - FAX_NUMBER
 - DISTRICT_N
 - STATION_TY
 - STAFF_HOUR
 - PUBLIC_ACCESS



We join the tables ...

Join tables

StationData
Stations
Stations - StationData

Stations
Shape
OBJECTID
POLICE_STA
STATION
STATION_NA
Latitude
Longitude

StationData
STATION
STATION_NAME
ADDRESS_ID
ADDRESS
ADDRESS_2
CITY
STATE
ZIP
PHONE_NUMBER
FAX_NUMBER
DISTRICT_N
STATION_TY
STAFF_HOUR
PUBLIC_ACCESS

Stations - StationData
Shape
OBJECTID
POLICE_STA
STATION
STATION_NA
Latitude
Longitude
STATION
ADDRESS_ID
ADDRESS
ADDRESS_2
CITY
STATE
ZIP
PHONE_NUMBER
FAX_NUMBER
DISTRICT_N
STATION_TY
STAFF_HOUR
PUBLIC_ACCESS

... and we get a results layer ...

Results layer

- StationData
- Stations
- Stations - StationData

- Shape
- OBJECTID
- POLICE_STA
- STATION
- STATION_NA
- Latitude
- Longitude

- STATION
- STATION_NAME
- ADDRESS_ID
- ADDRESS
- ADDRESS_2
- CITY
- STATE
- ZIP
- PHONE_NUMBER
- FAX_NUMBER
- DISTRICT_N
- STATION_TY
- STAFF_HOUR
- PUBLIC_ACCESS

- Stations - StationData
- Shape
- OBJECTID
- POLICE_STA
- STATION
- STATION_NA
- Latitude
- Longitude
- STATION
- ADDRESS_ID
- ADDRESS
- ADDRESS_2
- CITY
- STATE
- ZIP
- PHONE_NUMBER
- FAX_NUMBER
- DISTRICT_N
- STATION_TY
- STAFF_HOUR
- PUBLIC_ACCESS

... having all the fields ...

Results layer

- StationData
- Stations
- Stations - StationData

- Stations
 - Shape
 - OBJECTID
 - POLICE_STA
 - STATION
 - STATION_NA
 - Latitude
 - Longitude

- StationData
 - STATION
 - STATION_NAME
 - ADDRESS_ID
 - ADDRESS
 - ADDRESS_2
 - CITY
 - STATE
 - ZIP
 - PHONE_NUMBER
 - FAX_NUMBER
 - DISTRICT_N
 - STATION_TY
 - STAFF_HOUR
 - PUBLIC_ACCESS

- Stations - StationData
 - Shape
 - OBJECTID
 - POLICE_STA
 - STATION
 - STATION_NA
 - Latitude
 - Longitude
 - STATION
 - ADDRESS_ID
 - ADDRESS
 - ADDRESS_2
 - CITY
 - STATE
 - ZIP
 - PHONE_NUMBER
 - FAX_NUMBER
 - DISTRICT_N
 - STATION_TY
 - STAFF_HOUR
 - PUBLIC_ACCESS

...from both tables.

Results layer

- StationData
- Stations
- Stations - StationData

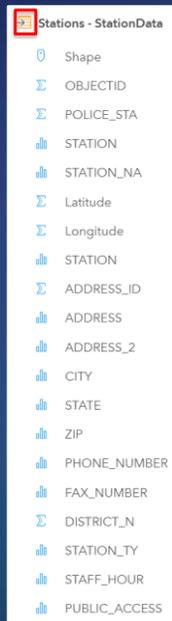
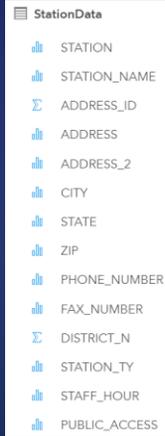
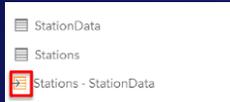
- Stations
 - Shape
 - OBJECTID
 - POLICE_STA
 - STATION
 - STATION_NA
 - Latitude
 - Longitude

- StationData
 - STATION
 - STATION_NAME
 - ADDRESS_ID
 - ADDRESS
 - ADDRESS_2
 - CITY
 - STATE
 - ZIP
 - PHONE_NUMBER
 - FAX_NUMBER
 - DISTRICT_N
 - STATION_TY
 - STAFF_HOUR
 - PUBLIC_ACCESS

- Stations - StationData
 - Shape
 - OBJECTID
 - POLICE_STA
 - STATION
 - STATION_NA
 - Latitude
 - Longitude
 - STATION
 - ADDRESS_ID
 - ADDRESS
 - ADDRESS_2
 - CITY
 - STATE
 - ZIP
 - PHONE_NUMBER
 - FAX_NUMBER
 - DISTRICT_N
 - STATION_TY
 - STAFF_HOUR
 - PUBLIC_ACCESS

<click>

Results layer



A results layer is identified by an orange icon ...

Results layer

- StationData
- Stations
- Stations - StationData

- Stations
- Shape
- OBJECTID
- POLICE_STA
- STATION
- STATION_NA
- Latitude
- Longitude

- StationData
- STATION
- STATION_NAME
- ADDRESS_ID
- ADDRESS
- ADDRESS_2
- CITY
- STATE
- ZIP
- PHONE_NUMBER
- FAX_NUMBER
- DISTRICT_N
- STATION_TY
- STAFF_HOUR
- PUBLIC_ACCESS

- Stations - StationData
- Shape
- OBJECTID
- POLICE_STA
- STATION
- STATION_NA
- Latitude
- Longitude
- STATION
- ADDRESS_ID
- ADDRESS
- ADDRESS_2
- CITY
- STATE
- ZIP
- PHONE_NUMBER
- FAX_NUMBER
- DISTRICT_N
- STATION_TY
- STAFF_HOUR
- PUBLIC_ACCESS

... whereas origin layers are identified by gray icons.

Results layer

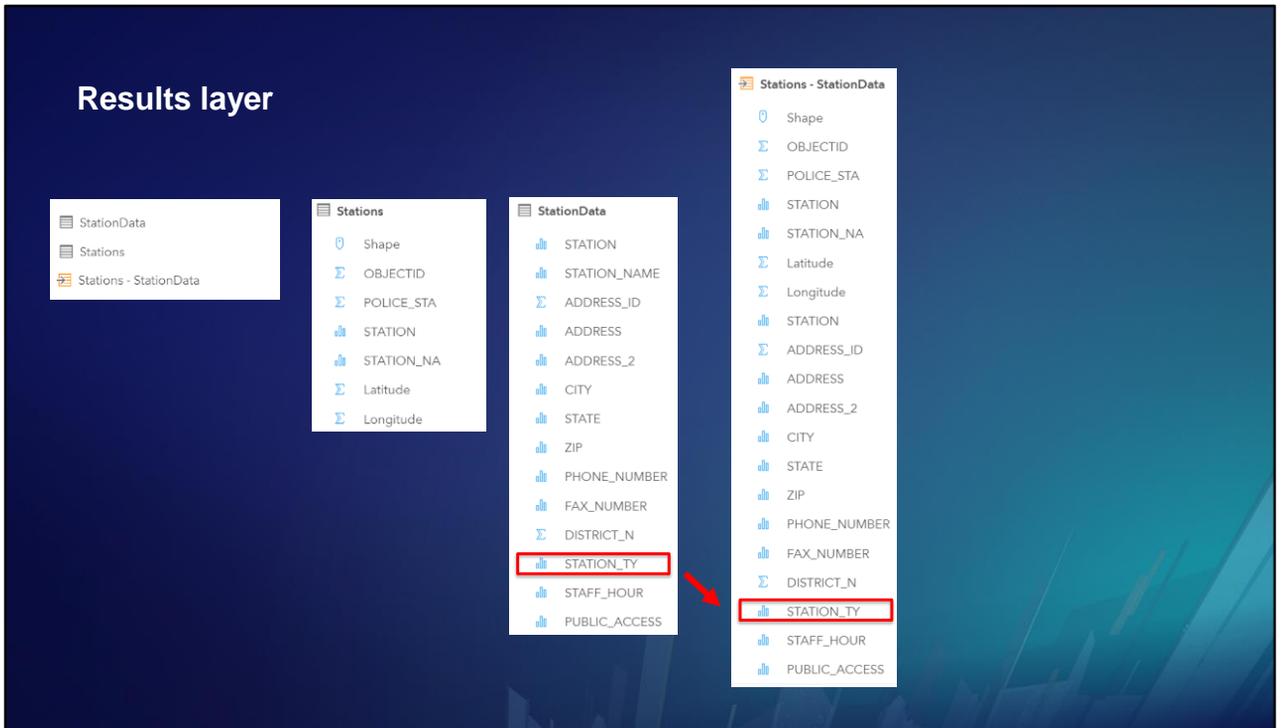
- StationData
- Stations
- Stations - StationData**

- Stations
- Shape
- OBJECTID
- POLICE_STA
- STATION
- STATION_NA
- Latitude
- Longitude

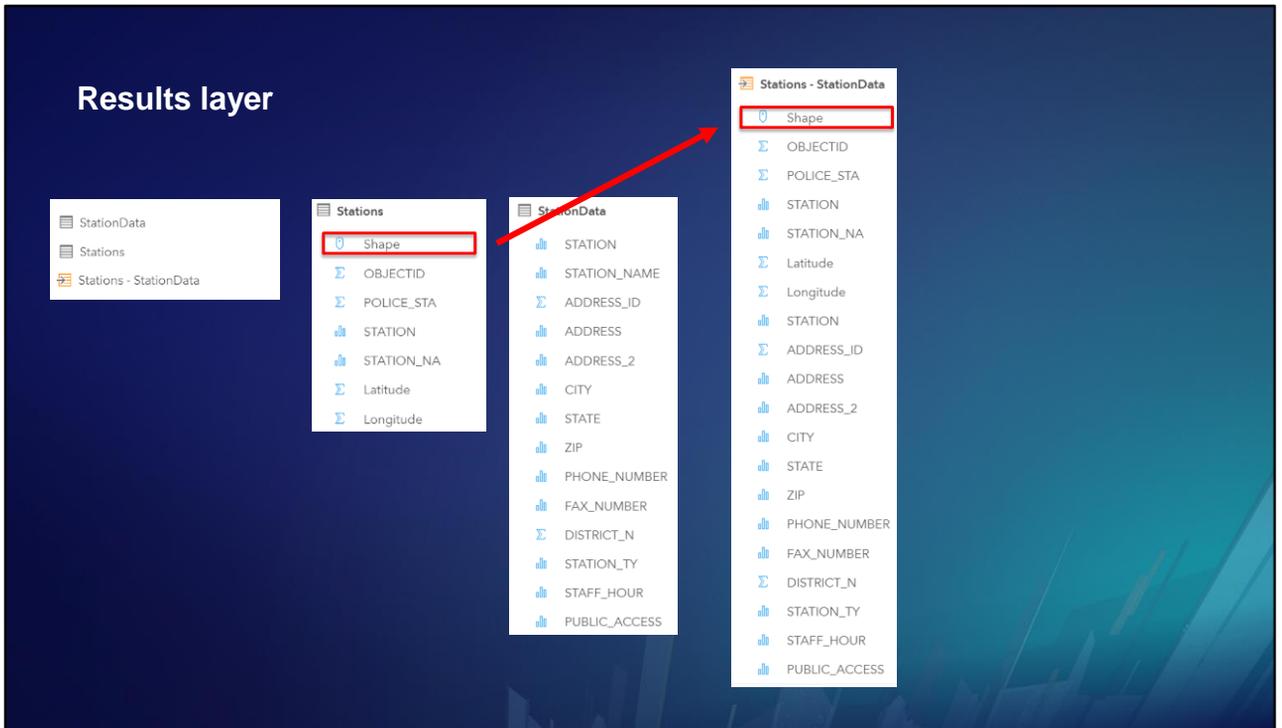
- StationData
- STATION
- STATION_NAME
- ADDRESS_ID
- ADDRESS
- ADDRESS_2
- CITY
- STATE
- ZIP
- PHONE_NUMBER
- FAX_NUMBER
- DISTRICT_N
- STATION_TY
- STAFF_HOUR
- PUBLIC_ACCESS

- Stations - StationData**
- Shape
- OBJECTID
- POLICE_STA
- STATION
- STATION_NA
- Latitude
- Longitude
- STATION
- ADDRESS_ID
- ADDRESS
- ADDRESS_2
- CITY
- STATE
- ZIP
- PHONE_NUMBER
- FAX_NUMBER
- DISTRICT_N
- STATION_TY
- STAFF_HOUR
- PUBLIC_ACCESS

Results layers are embedded inside the Insights Workbook, so they do not clutter your Portal content.

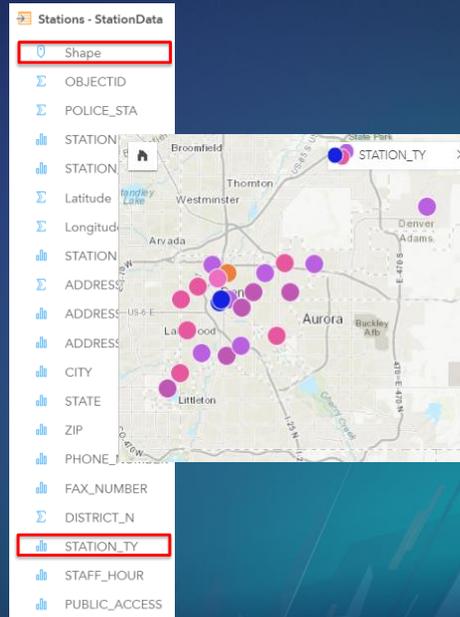
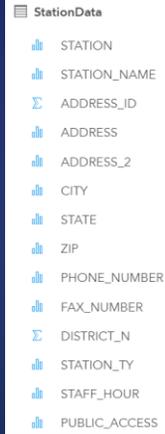
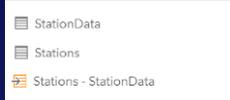


The Station Type field from the StationData table was brought into the results layer along with the other fields..



The results layer also received the shape field from the Stations table ...

Results layer



... so the Station Type field can be displayed on a map card, using colors to distinguish the different Station Types.

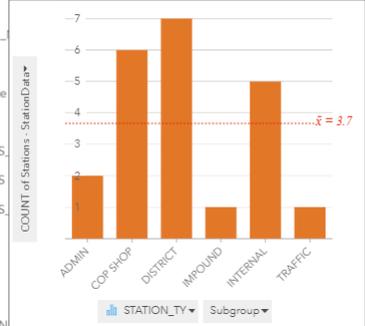
Results layer

- StationData
- Stations
- Stations - StationData

- Stations
- Shape
- OBJECTID
- POLICE_STA
- STATION
- STATION_NA
- Latitude
- Longitude

- StationData
- STATION
- STATION_NAME
- ADDRESS_ID
- ADDRESS
- ADDRESS_2
- CITY
- STATE
- ZIP
- PHONE_NUMBER
- FAX_NUMBER
- DISTRICT_N
- STATION_TY
- STAFF_HOUR
- PUBLIC_ACCESS

- Stations - StationData
- Shape
- OBJECTID
- POLICE_STA
- STATION
- STATION_NA
- Latitude
- Longitude
- STATION
- ADDRESS
- ADDRESS_2
- CITY
- STATE
- ZIP
- PHONE_NUMBER
- FAX_NUMBER
- DISTRICT_N
- STATION_TY
- STAFF_HOUR
- PUBLIC_ACCESS



Of course, the Station Type field can also be displayed on a chart card using either the origin table or the results table, because charts do not require location-enabled data ...

Results layer

- StationData
- Stations
- Stations - StationData

- Stations
 - Shape
 - OBJECTID
 - POLICE_STA
 - STATION
 - STATION_NA
 - Latitude
 - Longitude

- StationData
 - STATION
 - STATION_NAME
 - ADDRESS_ID
 - ADDRESS
 - ADDRESS_2
 - CITY
 - STATE
 - ZIP
 - PHONE_NUMBER
 - FAX_NUMBER
 - DISTRICT_N
 - STATION_TY
 - STAFF_HOUR
 - PUBLIC_ACCESS

- Stations - StationData
 - Shape
 - OBJECTID
 - POLICE_STA
 - STATION
 - STATION
 - Latitude
 - Longitude
 - STATION
 - ADDRESS
 - ADDRESS
 - ADDRESS
 - ADDRESS
 - CITY
 - STATE
 - ZIP
 - PHONE
 - FAX_NU
 - DISTRICT_N
 - STATION_TY
 - STAFF_HOUR
 - PUBLIC_ACCESS

Card 3

STATION_TY	COUNT of Stations - St...
ADMIN	2
COP SHOP	6
DISTRICT	7
IMPOUND	1
INTERNAL	5
TRAFFIC	1
Total 22	

... and neither do table cards.

Many ways to visualize data



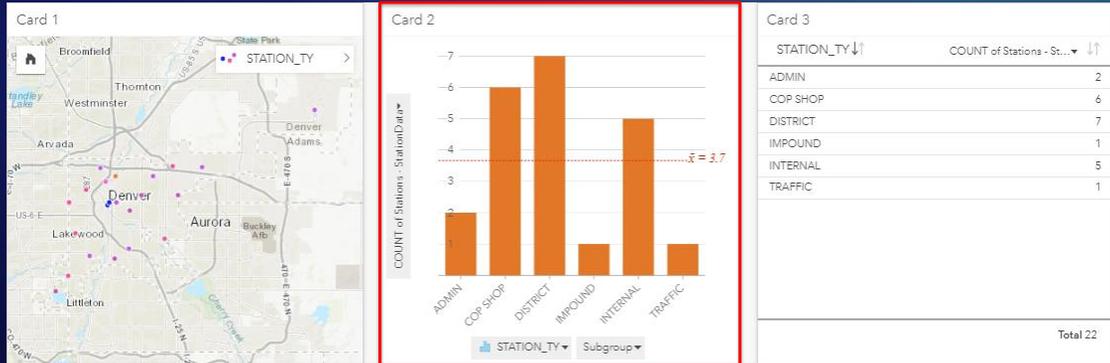
You can quickly visualize the same data, side by side, using different cards.

Many ways to visualize data



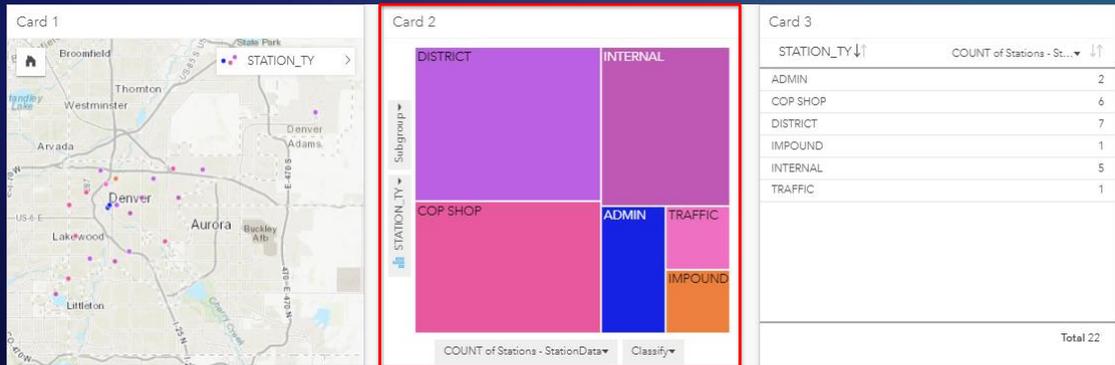
You can also select from multiple chart types, such as Bar Charts ...

Many ways to visualize data



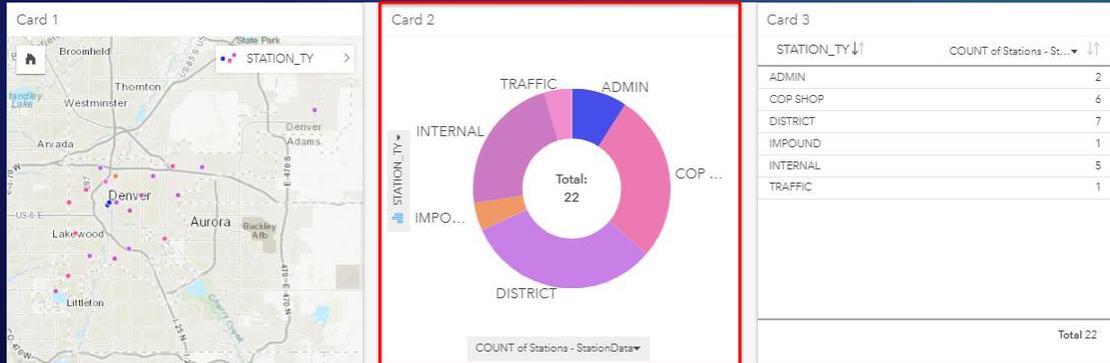
... Column Charts ...

Many ways to visualize data



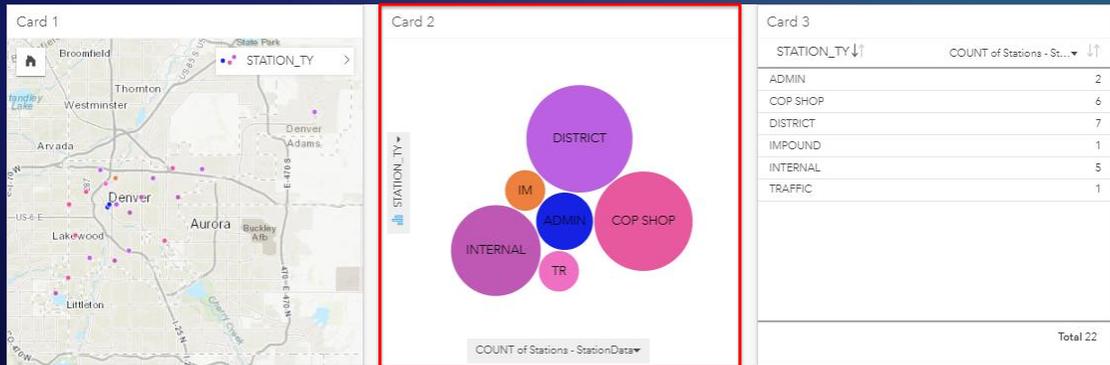
... Tree map charts ...

Many ways to visualize data



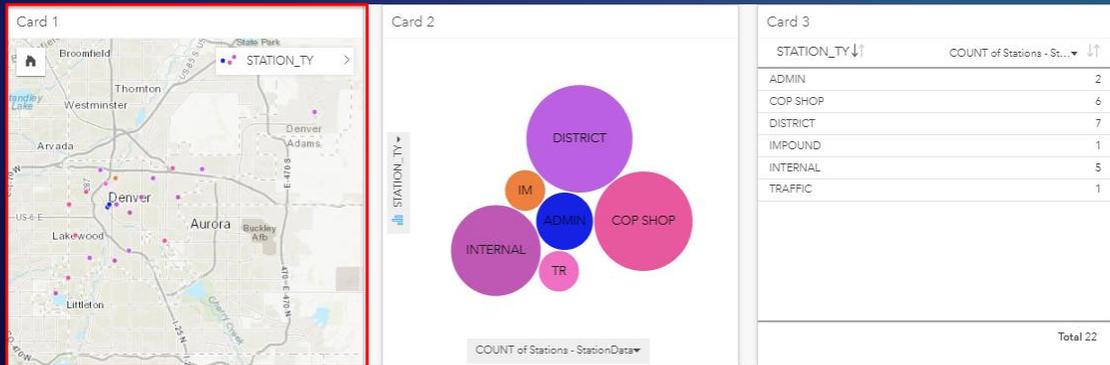
... Donut charts ...

Many ways to visualize data



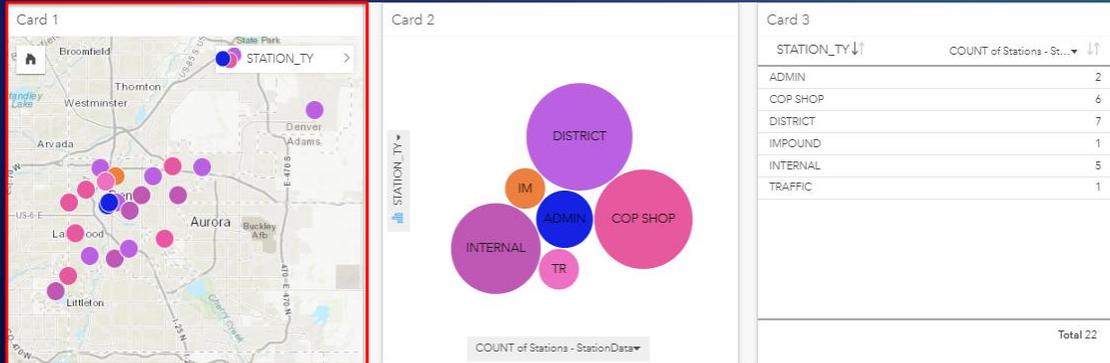
... and Bubble charts, Until you find the one that best conveys the information.

Many ways to visualize data



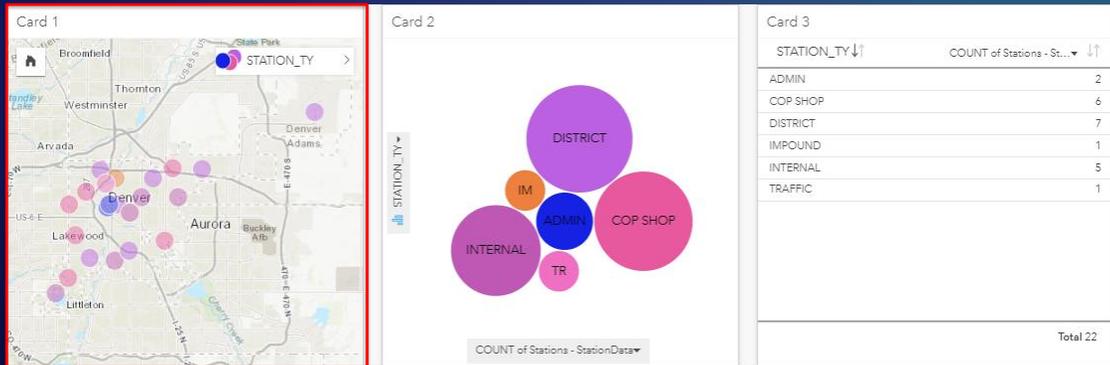
Insights uses Smart Mapping to automatically display your data on the map, so you can focus on deriving insights from the data. You can control basic display settings such as ...

Many ways to visualize data



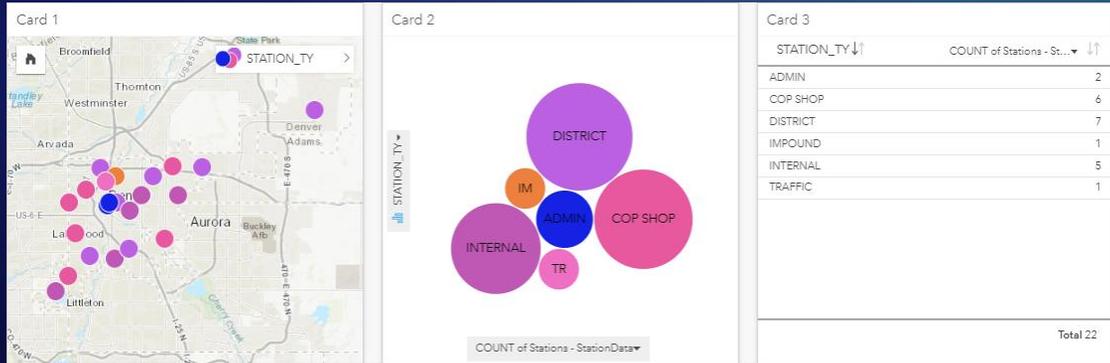
... symbol size ...

Many ways to visualize data



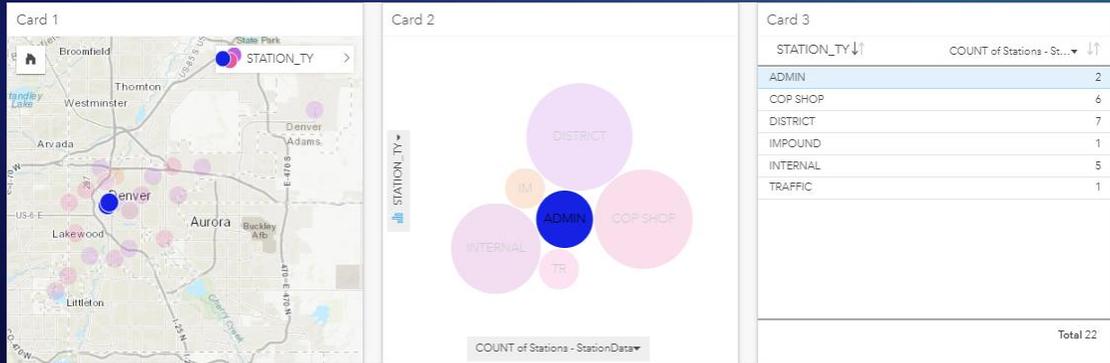
... transparency, and so on.

Cards are linked



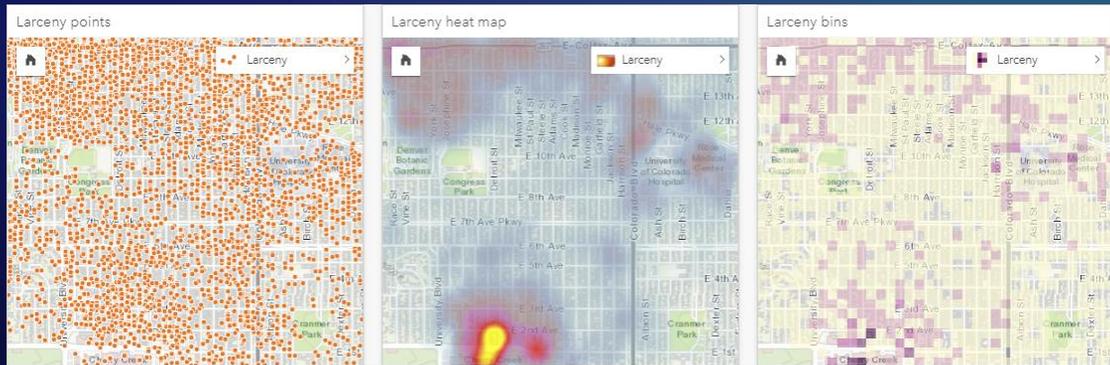
Selecting data on one card ...

Cards are linked



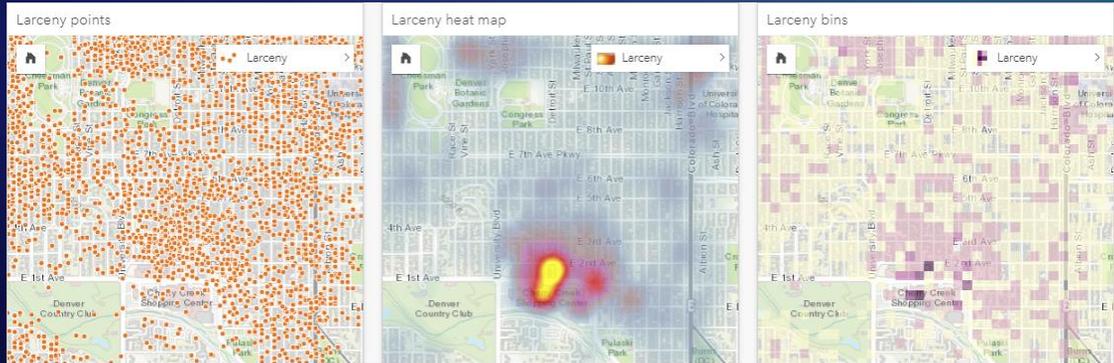
... automatically selects the same data on any other cards that show the same field.

Cards are linked



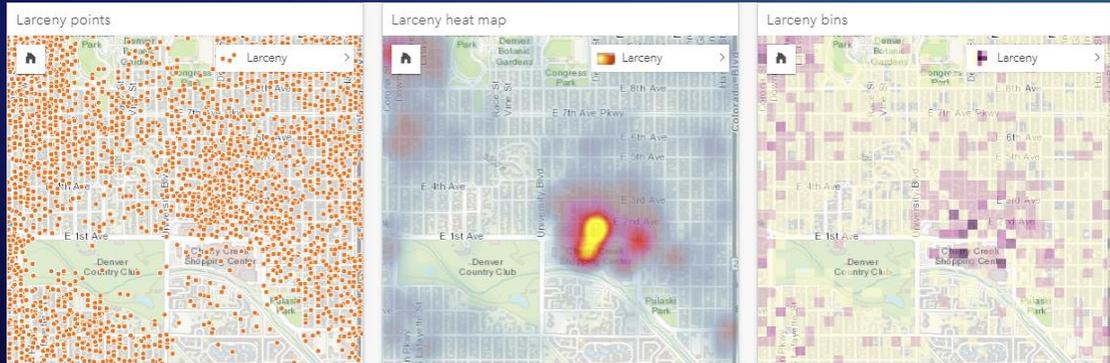
If you link the extents of map cards, you can zoom or pan one card ...

Cards are linked



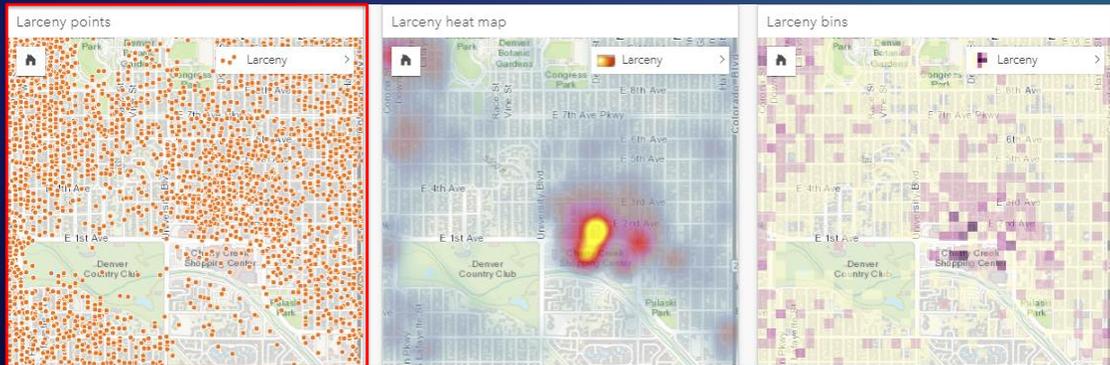
... and the other cards follow.

Cards are linked



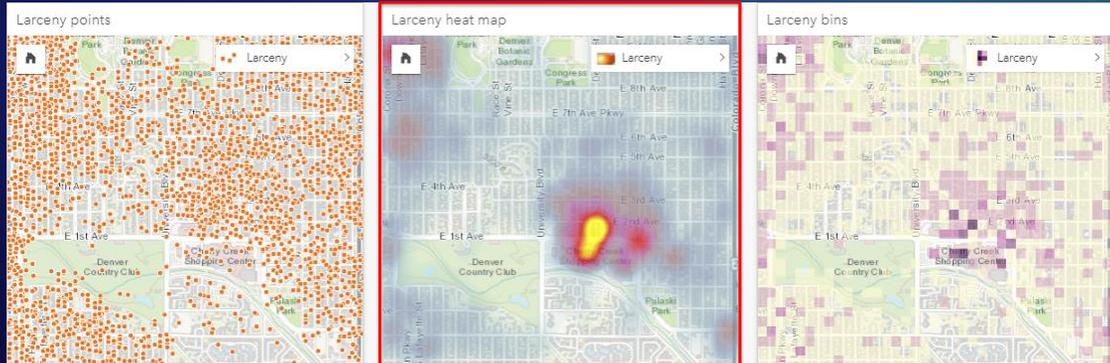
These maps show the same larceny data in three different ways.

Cards are linked



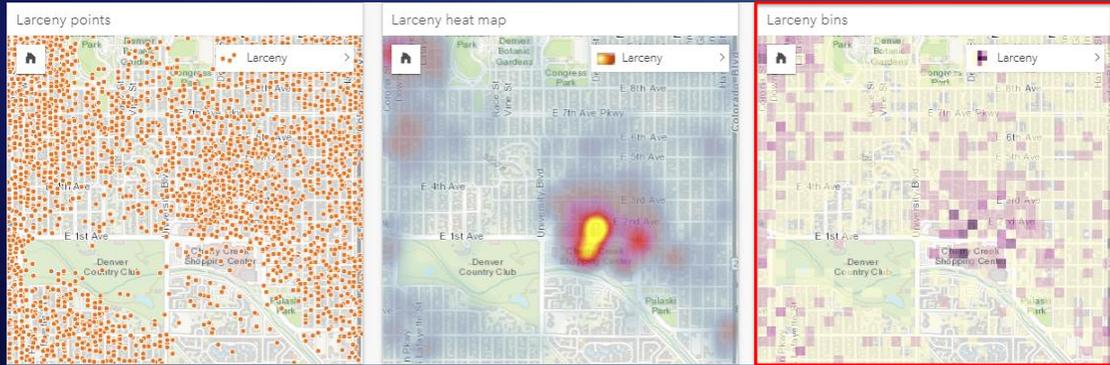
Visual detection of clusters on the left-hand point map can be difficult or misleading because many points are stacked on top of each other,

Cards are linked



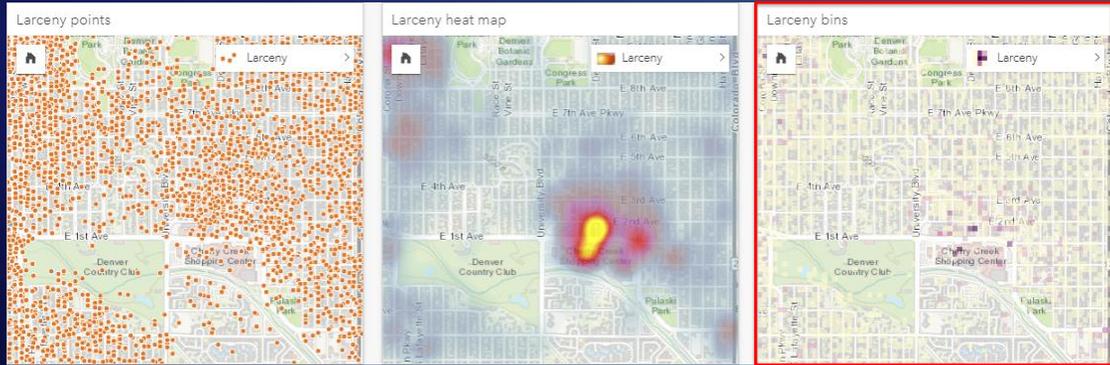
The heat map in the middle shows a cluster of larceny points that is not apparent on the point map ...

Cards are linked



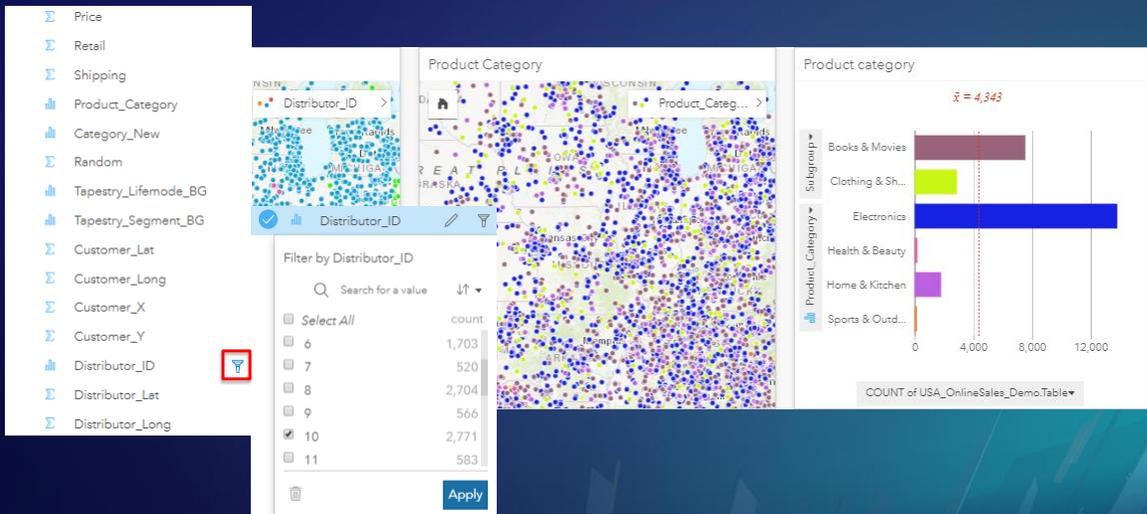
... and the bin map on the right depicts the cluster using darker colors for bins with more points in them.

Cards are linked



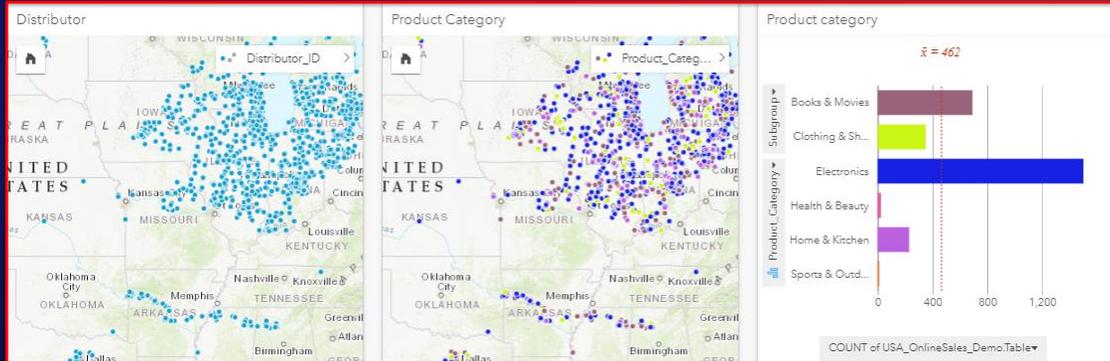
Bin size can be decreased to precisely target larceny concentrations ...

Dataset Filter



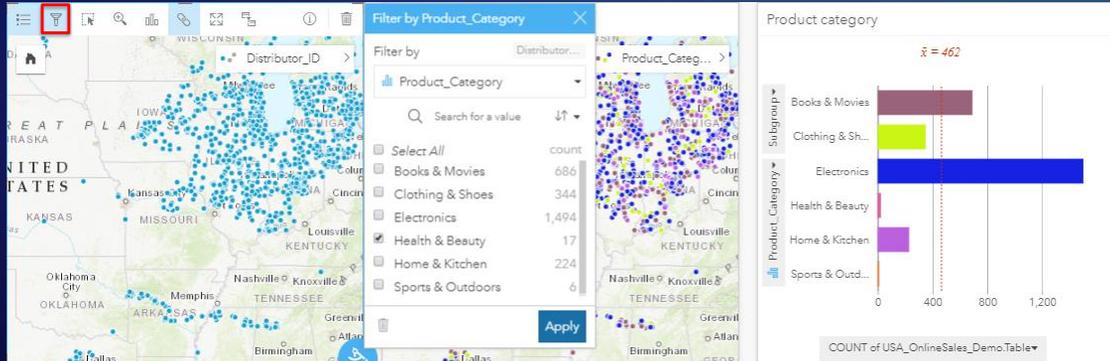
A dataset filter is applied to a field in the data pane. Here we are filtering out all sales except the ones from Distributor 10. Watch the maps and the chart on the right change when the dataset filter is applied

Dataset filter



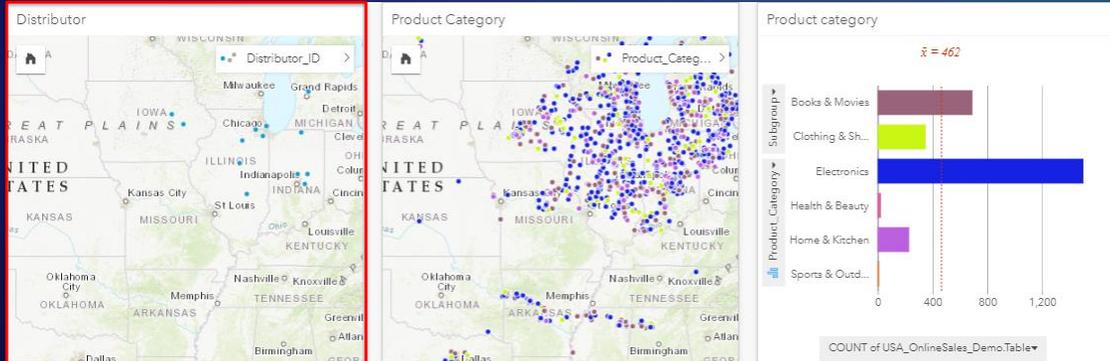
It filters out data for all the cards on the page that come from the filtered dataset. Now all the cards only show information for sales from Distributor 10.

Card Filter



A card filter is applied directly to a single card. Here we are selecting Health and Beauty products for the card on the left. We already have a dataset filter that limits all cards to sales from Distributor 10. Now we are going to also limit the card on the left to Health and Beauty product sales.

Card filter



A card filter has been applied to the card on the left. All the cards are still restricted to sales from Distributor 10, but only the card on the left is further restricted to Health and Beauty products.

Turning selected sets into filters



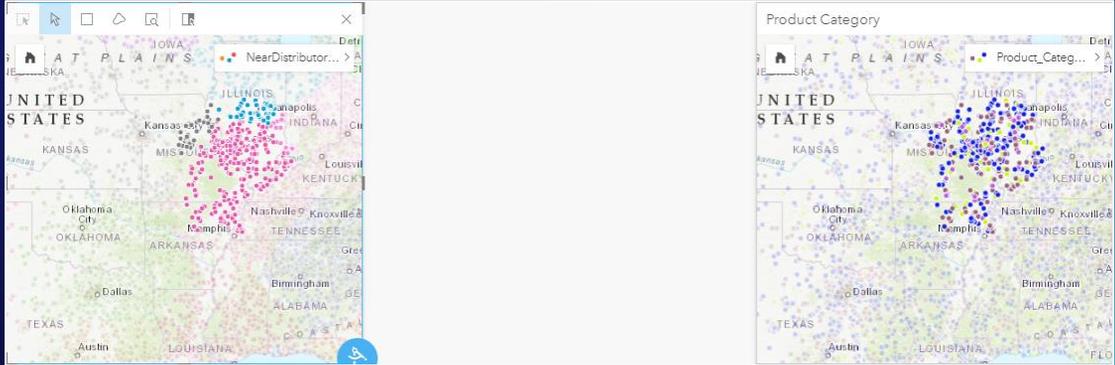
You can also turn your selected sets into filters.

Turning selected sets into filters



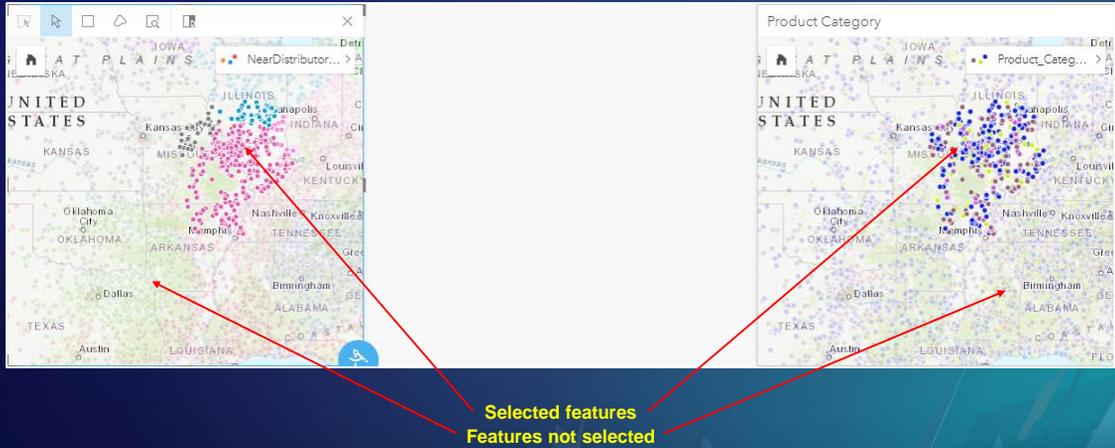
Here we use the lasso tool to select some sales of interest. The selection could have come from an analytic operation.

Turning selected sets into filters



<click>

Turning selected sets into filters



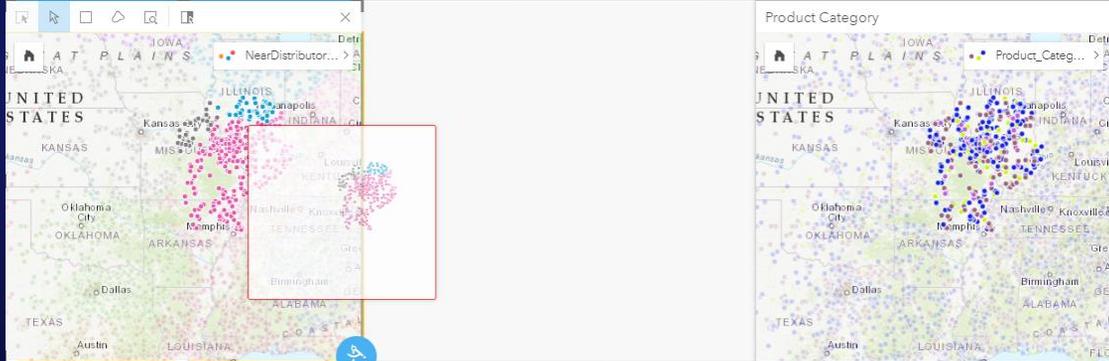
As expected, any other cards from the same dataset have the same selection.

Turning selected sets into filters



To make the selection into a spatial filter, simply drag any selected feature onto a new card.

Turning selected sets into filters



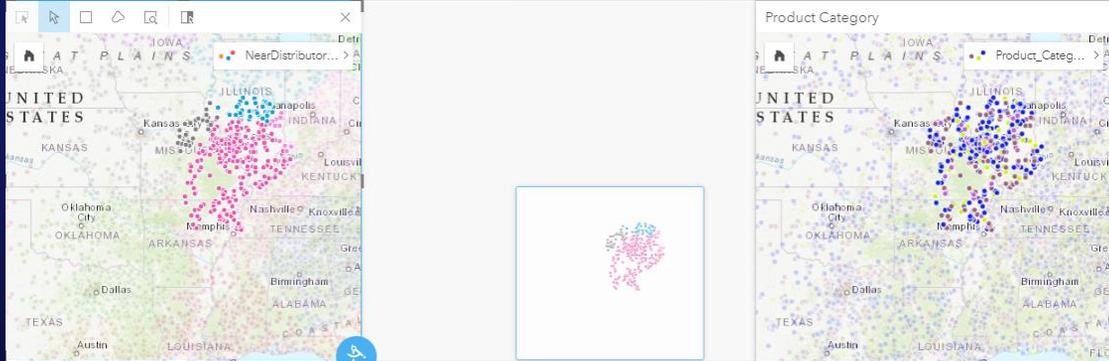
<click>

Turning selected sets into filters



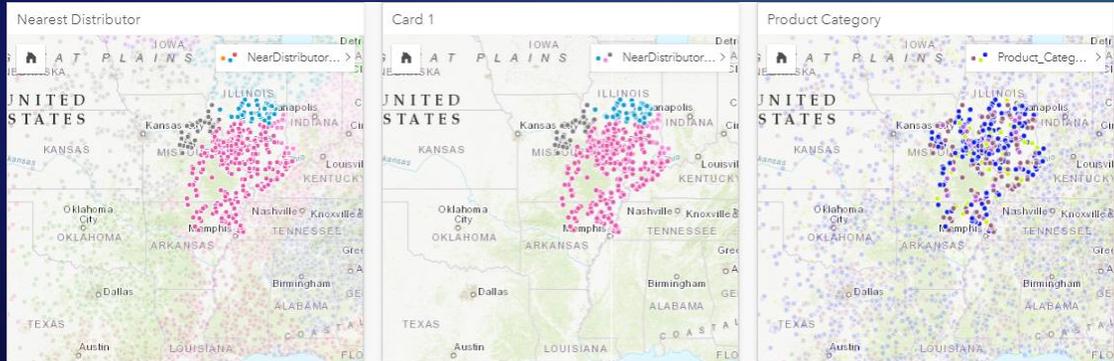
<click>

Turning selected sets into filters



<click>

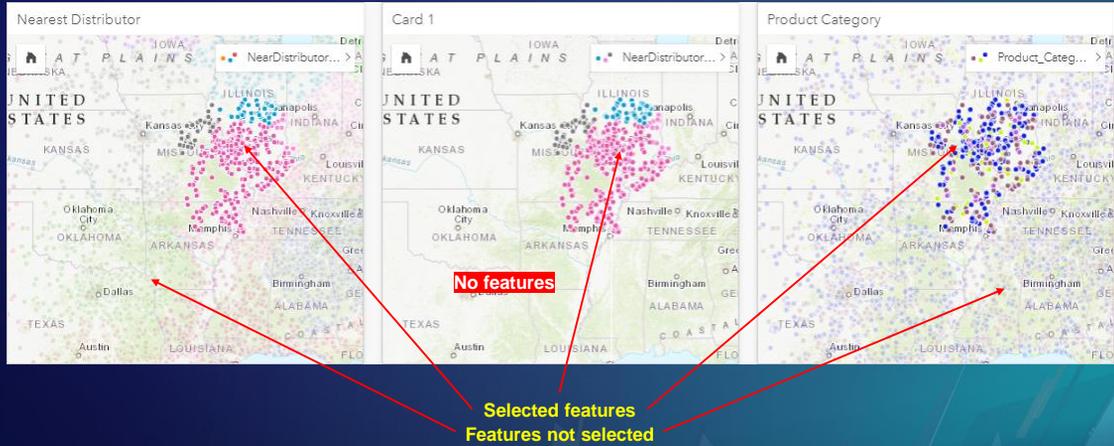
Turning selected sets into filters



Spatial Filter

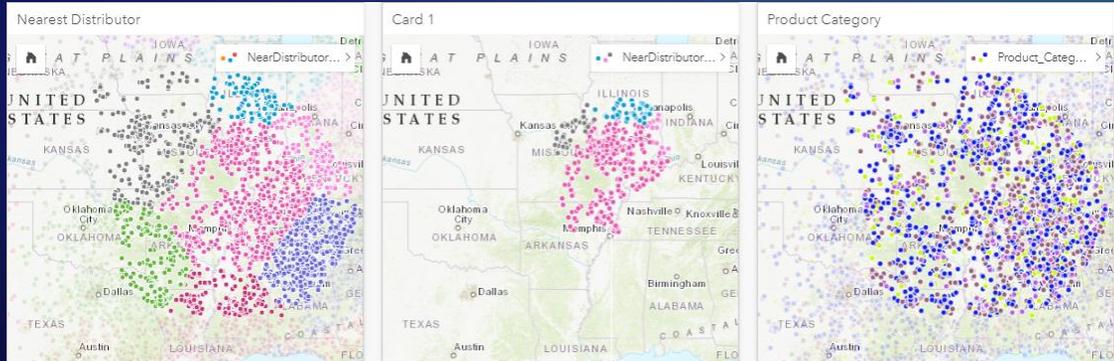
Now the new card is filtered to only have the selected features.

Turning selected sets into filters



Notice that the unselected features are dim on the other cards, but they are absent from the card having the spatial filter.

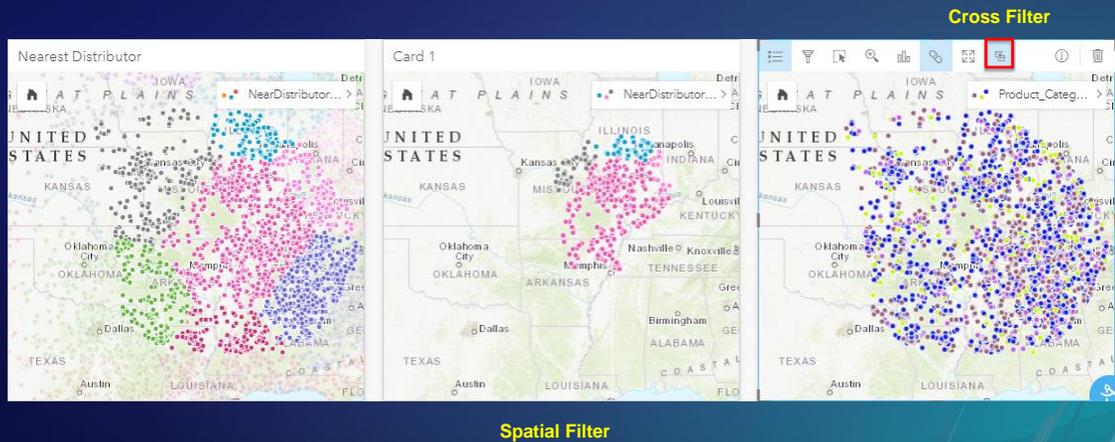
Turning selected sets into filters



Spatial Filter

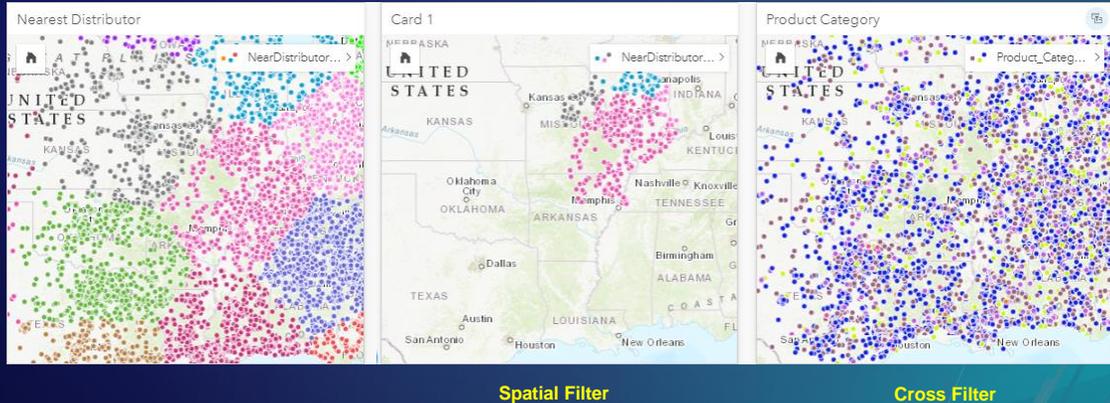
If we make a new, larger selection, the spatial filter on the card in the middle is NOT changed, so the newly selected features do not show up on this card.

Turning selected sets into filters



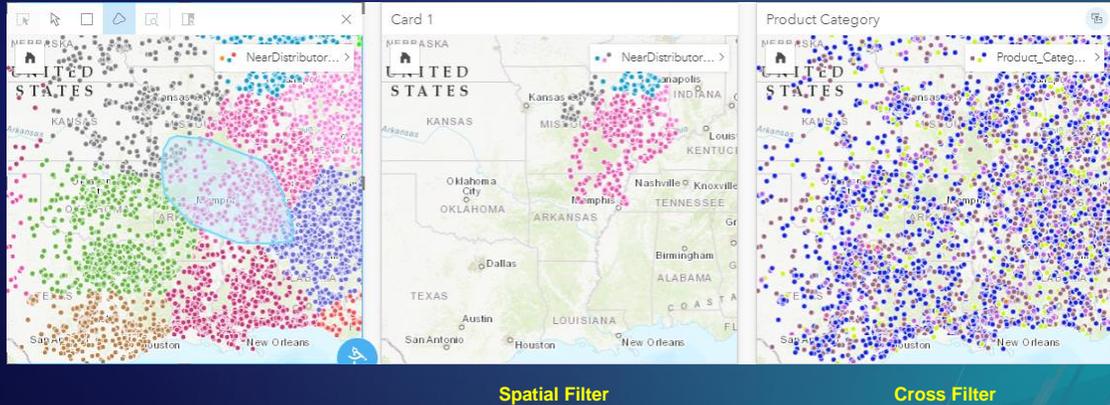
A cross filter is a more dynamic way to filter using a selection. When we apply a cross-filter to the card on the right, it is filtered to only include selected features.

Turning selected sets into filters



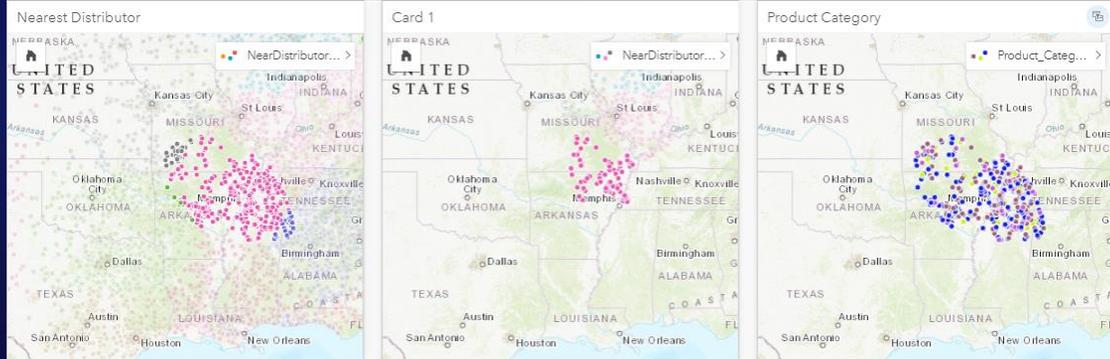
With a cross filter applied to the card on the right, we clear the selected set. The card with the spatial filter is unaffected, but the one with the cross filter now shows all rows.

Turning selected sets into filters



With a cross filter applied to the card on the right, we make a selection on the left card.

Turning selected sets into filters

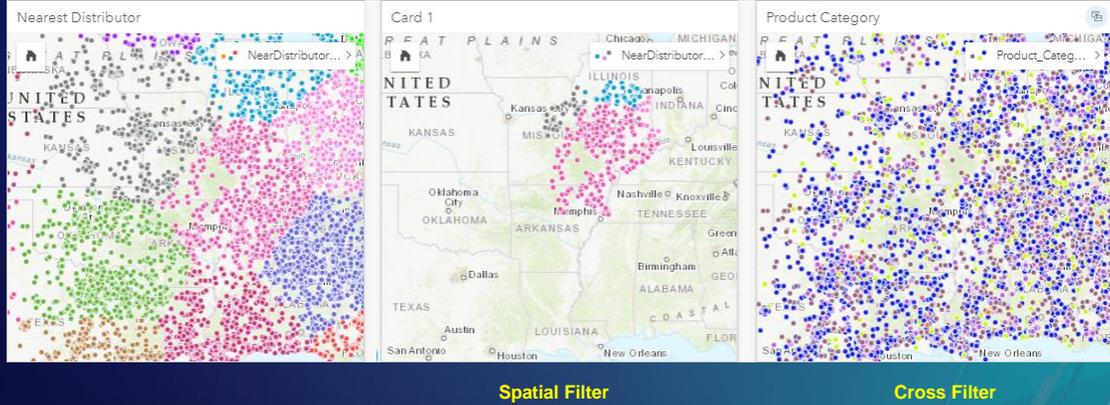


Spatial Filter

Cross Filter

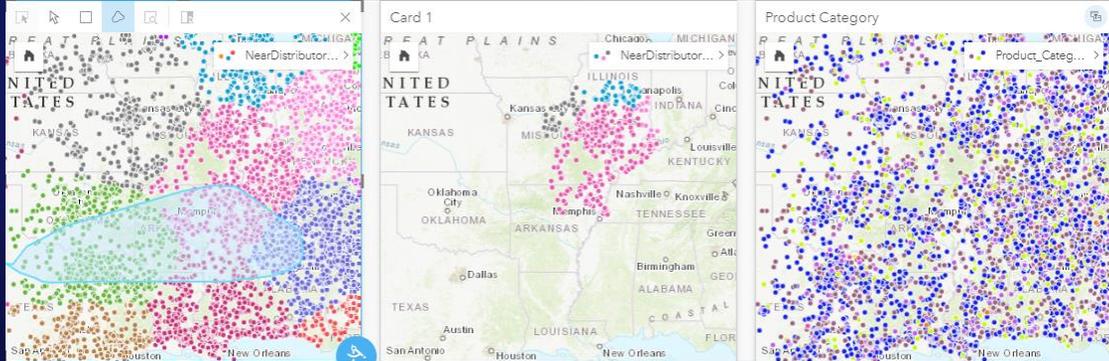
The cross filter dynamically filters out all features except the CURRENT selection. The features shown on the card with the spatial filter do not change as the selected set changes, but its selected set continues to respond to selections on other cards.

Turning selected sets into filters



If we clear the selection, the spatial filter on the middle card is unaffected.

Turning selected sets into filters

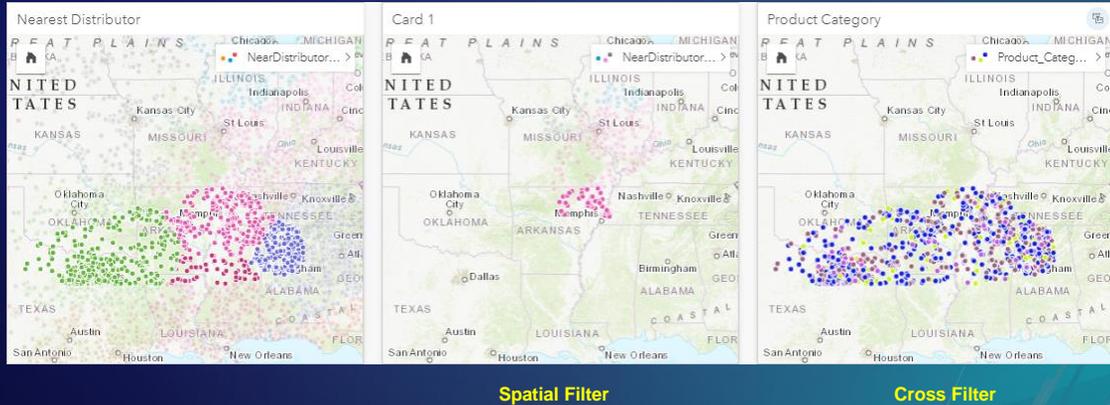


Spatial Filter

Cross Filter

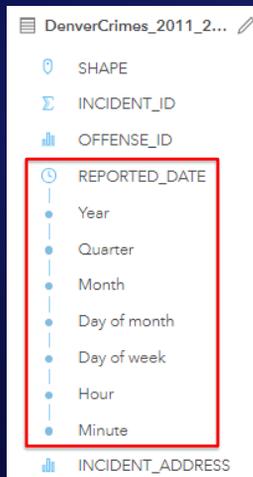
If we make a new selection ...

Turning selected sets into filters



... The card with the spatial filter responds to the selection, but its spatial filter is unaffected. Meanwhile, the cross filter always filters out everything that is not in the selected set.

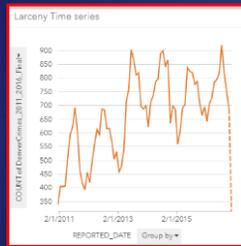
Date/time fields



Insights for ArcGIS automatically breaks date/time fields up into their components.

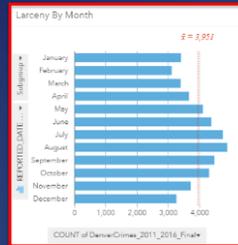
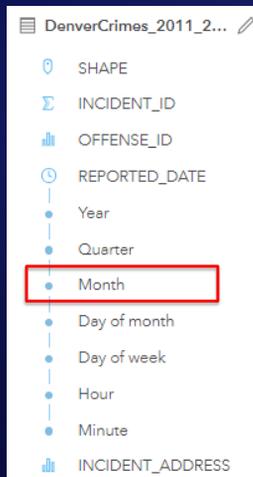
Date/time fields

A screenshot of a data field list for a dataset named 'DenverCrimes_2011_2...'. The list includes the following fields: SHAPE, INCIDENT_ID, OFFENSE_ID, REPORTED_DATE (highlighted with a red box), Year, Quarter, Month, Day of month, Day of week, Hour, Minute, and INCIDENT_ADDRESS.



In this example, we have filtered crimes to only show larceny. If we make a chart of the date field itself, we always get a Time Series chart showing the cyclic nature of larceny.

Date/time fields

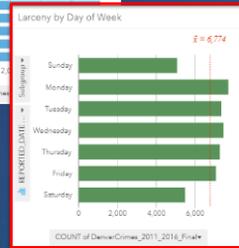
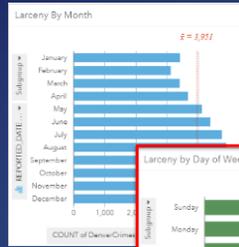
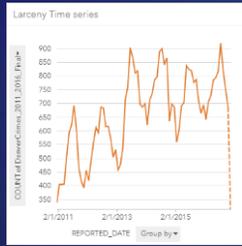


But if we pick the month component of the date/time field, we get 12 discrete larceny values in a string field called month. A String field can be visualized using many chart types. In this case, we choose a Bar Chart. Larceny appears to have an annual cycle ...

Date/time fields

DenverCrimes_2011_2...

- SHAPE
- INCIDENT_ID
- OFFENSE_ID
- REPORTED_DATE
 - Year
 - Quarter
 - Month
 - Day of month
 - Day of week**
 - Hour
 - Minute
- INCIDENT_ADDRESS

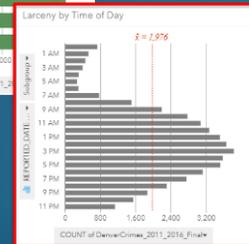
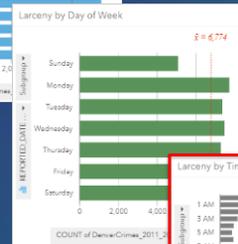
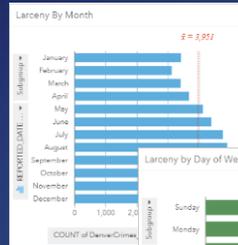


... and a weekly cycle ...

Date/time fields

DenverCrimes_2011_2...

- SHAPE
- INCIDENT_ID
- OFFENSE_ID
- REPORTED_DATE
 - Year
 - Quarter
 - Month
 - Day of month
 - Day of week
 - Hour**
 - Minute
- INCIDENT_ADDRESS

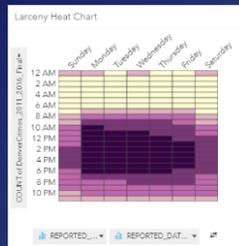


... And there is certainly a daily cycle based on the hour of the day or night.

Charts using two fields

DenverCrimes_2011_2...

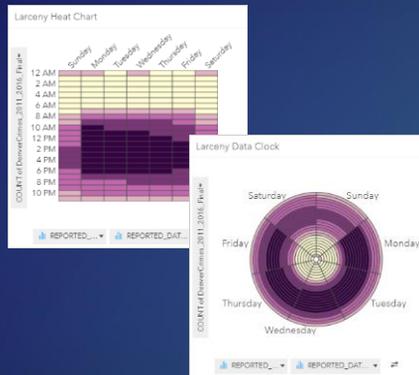
- SHAPE
- INCIDENT_ID
- OFFENSE_ID
- REPORTED_DATE
 - Year
 - Quarter
 - Month
 - Day of month
 - Day of week**
 - Hour**
 - Minute
- INCIDENT_ADDRESS



If we select two fields, we can make a heat chart. Here we see that larceny is concentrated on weekday afternoons. Apparently, thieves like to take weekends off and sleep in.

Charts using two fields

A screenshot of a data visualization tool's field list for a dataset named 'DenverCrimes_2011_2...'. The list includes fields such as SHAPE, INCIDENT_ID, OFFENSE_ID, REPORTED_DATE, Year, Quarter, Month, Day of month, Day of week, Hour, Minute, and INCIDENT_ADDRESS. The 'Day of week' and 'Hour' fields are highlighted with a red rectangular box.

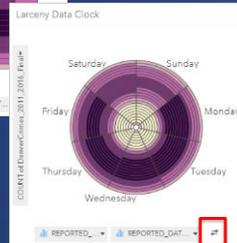
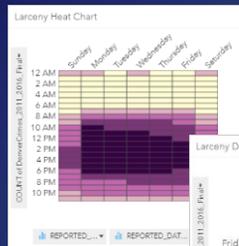


Here are the same two fields in a data clock. It does not seem to present the information as clearly as the previous chart.

Charts using two fields

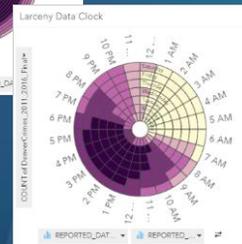
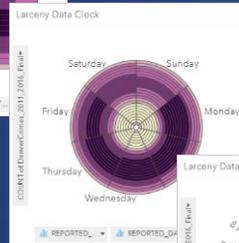
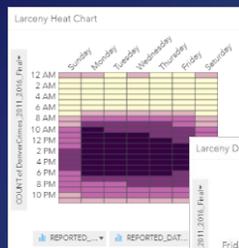
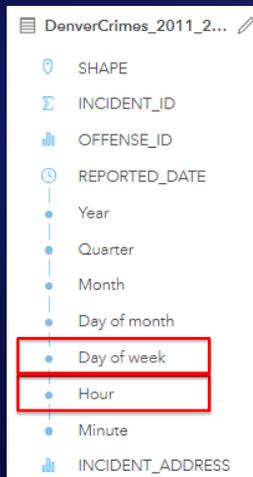
DenverCrimes_2011_2...

- SHAPE
- INCIDENT_ID
- OFFENSE_ID
- REPORTED_DATE
 - Year
 - Quarter
 - Month
 - Day of month
 - Day of week**
 - Hour**
 - Minute
- INCIDENT_ADDRESS



Let's switch the fields on the chart.

Charts using two fields

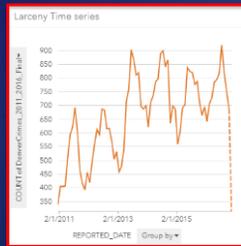


It may be more intuitive when the dial of the clock shows time of day. Which chart type do you think works best in this case?

Using Group By to show a second field

DenverCrimes_2011_2...

- SHAPE
- INCIDENT_ID
- OFFENSE_ID
- REPORTED_DATE**
- Year
- Quarter
- Month
- Day of month
- Day of week
- Hour
- Minute
- INCIDENT_ADDRESS



If we go back to the time series chart, we see a trend in larceny, but how does that break down?

Using Group By to show a second field

DenverCrimes_2011_2...

- SHAPE
- INCIDENT_ID
- OFFENSE_ID
- REPORTED_DATE
 - Year
 - Quarter
 - Month
 - Day of month
 - Day of week
 - Hour
 - Minute
- INCIDENT_ADDRESS

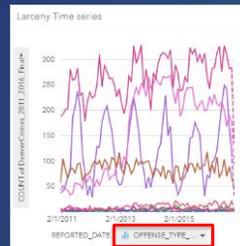


If we use Group By and choose Offence Type....

Using Group By to show a second field

DenverCrimes_2011_2...

- SHAPE
- INCIDENT_ID
- OFFENSE_ID
- REPORTED_DATE
 - Year
 - Quarter
 - Month
 - Day of month
 - Day of week
 - Hour
 - Minute
- INCIDENT_ADDRESS



Layer options

OFFENSE_TYPE_NAME

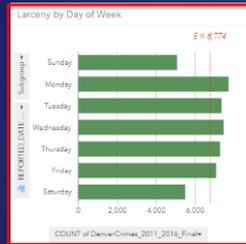
- Bicycle theft
- Pocketpicking
- Purse snatching without force
- Shoplifting
- Theft - other

...we get a separate time series line for each type of larceny.

Using Group By to show a second field

DenverCrimes_2011_2...

- SHAPE
- INCIDENT_ID
- OFFENSE_ID
- REPORTED_DATE
 - Year
 - Quarter
 - Month
 - Day of month
 - Day of week**
 - Hour
 - Minute
- INCIDENT_ADDRESS

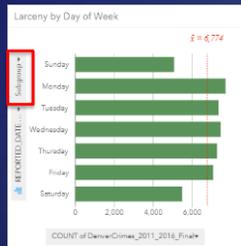


Here's the Day of Week Bar Chart...

Using Group By to show a second field

DenverCrimes_2011_2...

- SHAPE
- INCIDENT_ID
- OFFENSE_ID
- REPORTED_DATE
 - Year
 - Quarter
 - Month
 - Day of month
 - Day of week
 - Hour
 - Minute
- INCIDENT_ADDRESS

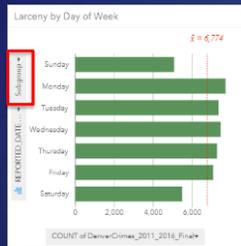


We select Subgroup ...

Using Group By to show a second field

DenverCrimes_2011_2...

- SHAPE
- INCIDENT_ID
- OFFENSE_ID
- REPORTED_DATE
 - Year
 - Quarter
 - Month
 - Day of month
 - Day of week
 - Hour
 - Minute
- INCIDENT_ADDRESS

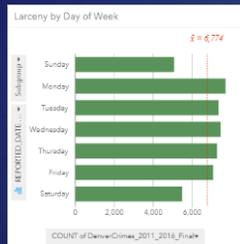


... and choose Offense Type.

Using Group By to show a second field

DenverCrimes_2011_2...

- SHAPE
- INCIDENT_ID
- OFFENSE_ID
- REPORTED_DATE
 - Year
 - Quarter
 - Month
 - Day of month
 - Day of week
 - Hour
 - Minute
- INCIDENT_ADDRESS

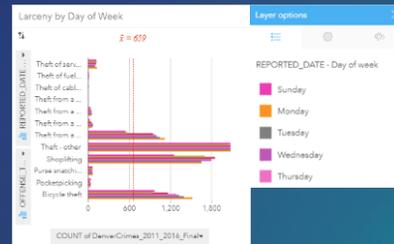
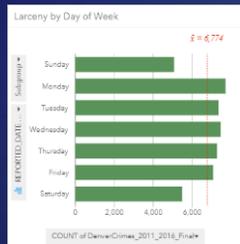


If the chart is difficult to interpret, ...

Using Group By to show a second field

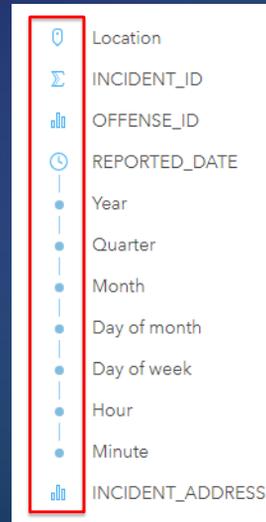
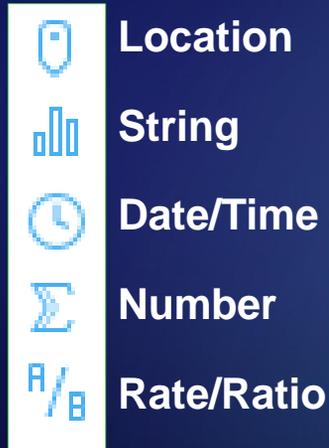
DenverCrimes_2011_2...

- SHAPE
- INCIDENT_ID
- OFFENSE_ID
- REPORTED_DATE
 - Year
 - Quarter
 - Month
 - Day of month
 - Day of week
 - Hour
 - Minute
- INCIDENT_ADDRESS



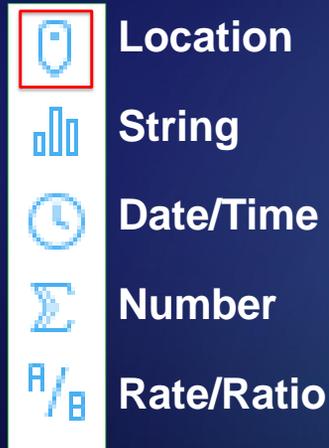
... try flipping the fields.

Field roles control how fields are used



We have already used different field roles, but we haven't explained what they are.

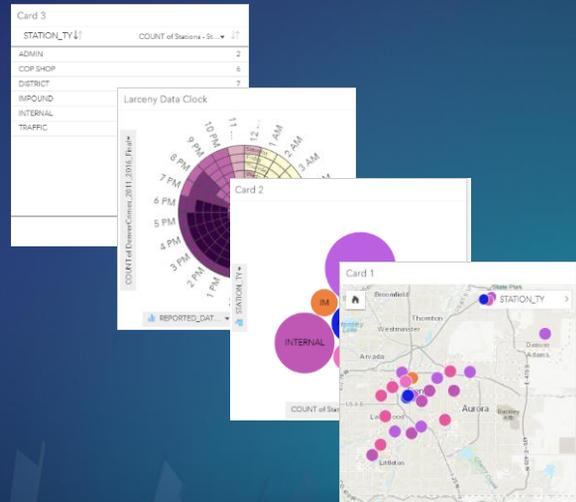
Field roles control how fields are used



We have seen that a Location field is required to make a map card ...

Field roles control how fields are used

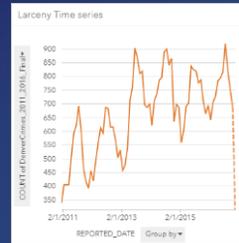
	Location
	String
	Date/Time
	Number
	Rate/Ratio



... and string fields categorize data on all kinds of cards.

Field roles control how fields are used

-  Location
-  String
-  Date/Time
-  Number
-  Rate/Ratio

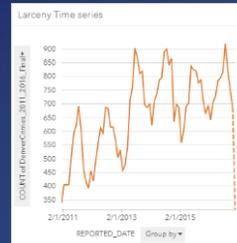


-  REPORTED_DATE
- Year
- Quarter
- Month
- Day of month
- Day of week
- Hour
- Minute

A date/time field is visualized as a Time Series chart ...

Field roles control how fields are used

-  Location
-  String
-  Date/Time
-  Number
-  Rate/Ratio



-  REPORTED_DATE
 -  Year
 -  Quarter
 -  Month
 -  Day of month
 -  Day of week
 -  Hour
 -  Minute

... and insights also presents its component parts ...

Field roles control how fields are used

-  Location
-  String
-  Date/Time
-  Number
-  Rate/Ratio



...which can be analyzed separately to reveal cyclic trends.

Field roles control how fields are used

	Location	 SITE_ID
	String	 SITE_NAME
	Date/Time	 TREE_COUNT
	Number	 TREE_PERCENT
	Rate/Ratio	

Sometimes a field stores numbers that are really just identifiers or categories. They do not always have a mathematically numeric meaning.

Field roles control how fields are used

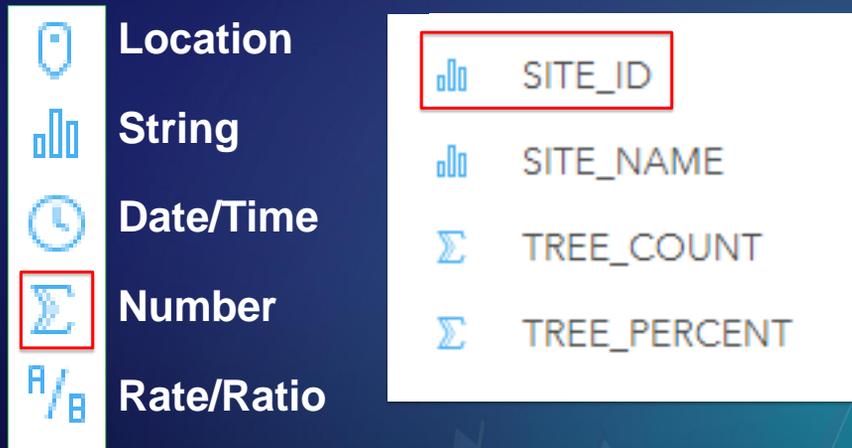
The diagram illustrates field roles and their application to data fields. On the left, a vertical list of icons and labels defines the roles: Location (tag icon), String (bar chart icon), Date/Time (clock icon), Number (sum icon, highlighted with a red box), and Rate/Ratio (A/B icon). On the right, a white box lists data fields with their corresponding icons: SITE_ID (sum icon, highlighted with a red box), SITE_NAME (bar chart icon), TREE_COUNT (sum icon), and TREE_PERCENT (sum icon).

For example, the `SITE_ID` field merely identifies a site. It does not denote any kind of quantity. A larger `SITE_ID` does not mean that the site is larger or better in some way.

`SITE_ID` is essentially a String, even though it is stored as a Number.

Therefore, we should change its field role to String, so Insights will treat it like one.

Field roles control how fields are used



	Location		SITE_ID
	String		SITE_NAME
	Date/Time		TREE_COUNT
	Number		TREE_PERCENT
	Rate/Ratio		

Now SITE_ID will be visualized as an identifier or category on charts, maps, and tables.

Field roles control how fields are used

	Location		SITE_ID
	String		SITE_NAME
	Date/Time		TREE_COUNT
	Number		TREE_PERCENT
	Rate/Ratio		

TREE COUNT and Tree Percent are both numeric, but they are different kinds of values. TREE COUNT is an absolute measurement, whereas TREE PERCENT is a rate or ratio.

For example, a one-hectare parcel with TREE COUNT of 100 trees is more densely forested than a ten-hectare parcel with 100 trees.

Field roles control how fields are used

	Location	 SITE_ID
	String	 SITE_NAME
	Date/Time	 TREE_COUNT
	Number	 TREE_PERCENT
	Rate/Ratio	

TREE PERCENT is really a Rate or Ratio, and it should be treated differently than TREE COUNT. It depicts the density of tree coverage as opposed to the total number of trees.

Field roles control how fields are used

	Location	 SITE_ID
	String	 SITE_NAME
	Date/Time	 TREE_COUNT
	Number	 TREE_PERCENT
	Rate/Ratio	

Therefore, we change its Field Role to Rate/Ratio.

Field roles control how fields are used

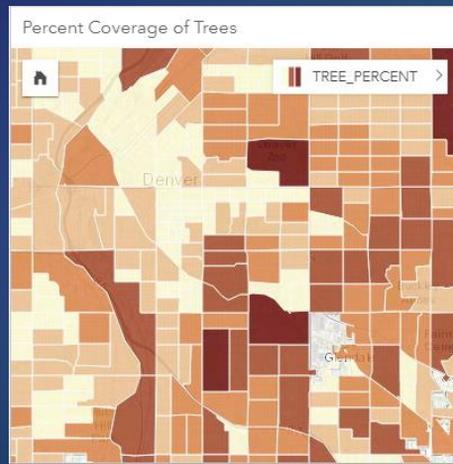
	Location		SITE_ID
	String		SITE_NAME
	Date/Time		TREE_COUNT
	Number		TREE_PERCENT
	Rate/Ratio		

The Field Role is the role a field plays in your analysis.
It is based on what the field values MEAN, not how they are STORED.

Working with quantitative data



 Graduated Symbol map



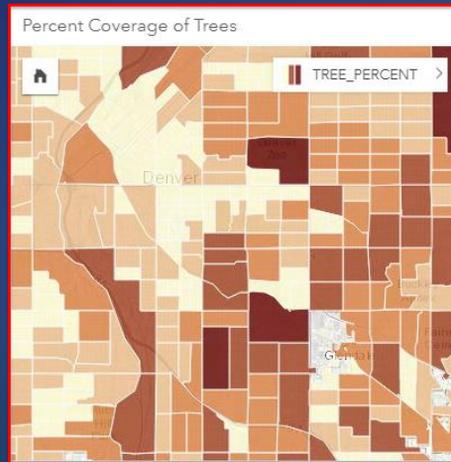
 Choropleth map

The default map for a Number field is a Graduated Symbol map ...

Working with quantitative data



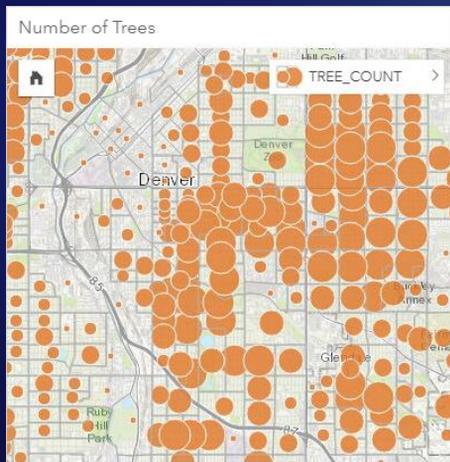
Graduated Symbol map



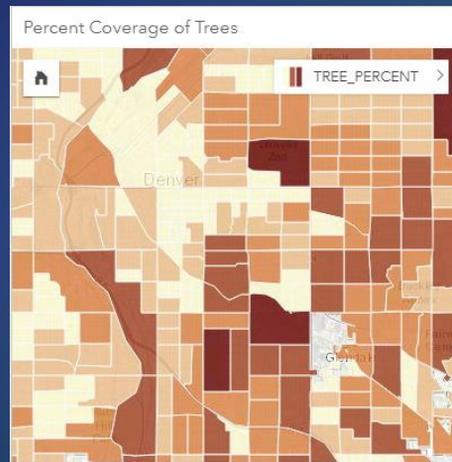
Choropleth map

... whereas the default map for a Rate/Ratio field is a Choropleth, or graduated color map.

Working with quantitative data



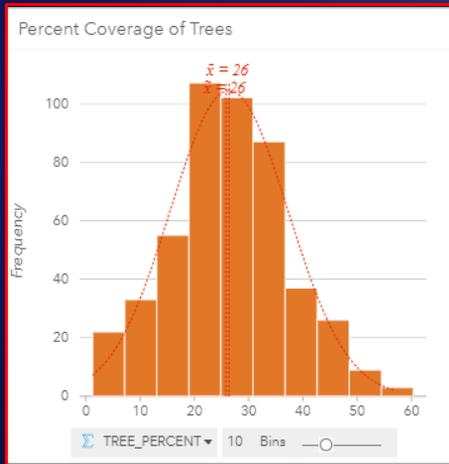
Graduated Symbol map



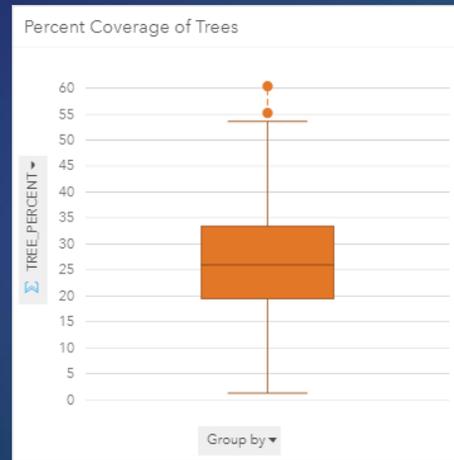
Choropleth map

Larger or smaller circles connote QUANTITIES, whereas color intensity connotes DENSITY. If you use Graduated Symbols for a rate/ratio field, the map could be misleading. For example, a tiny parcel with a very high tree density would appear as a very large circle on the map, even though the circle would represent only a few trees in terms of absolute numbers.

Working with quantitative data



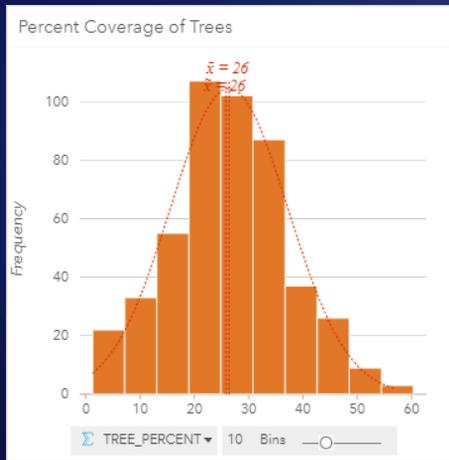
Histogram



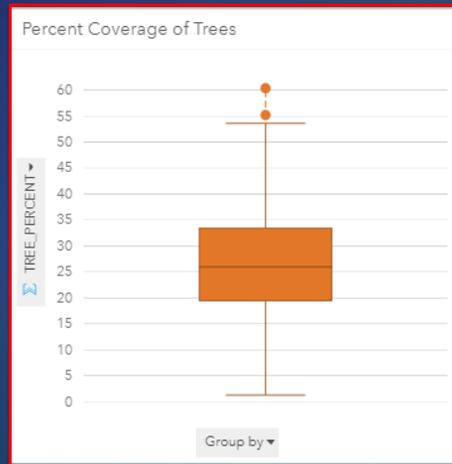
Box Plot

The default Chart for both Number and Rate/Ratio fields is the Histogram. In this example, Tree Percent is the horizontal axis, and the number of occurrences, or frequency, is the vertical axis.

Working with quantitative data



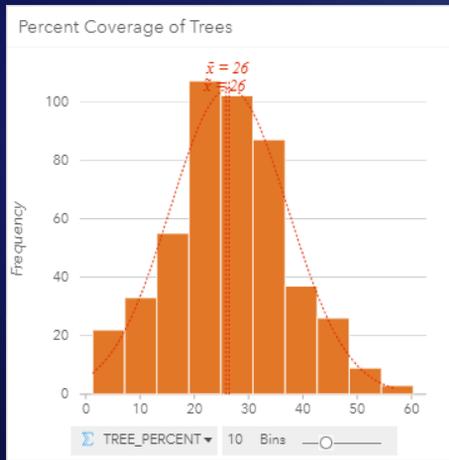
Histogram



Box Plot

The box plot on the right shows the same information in a different way.

Working with quantitative data



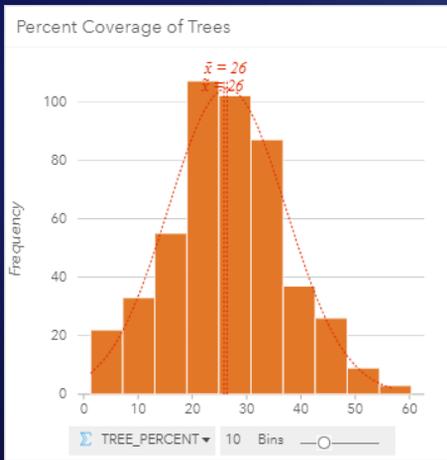
Histogram



Box Plot

The box represents the upper and lower quartiles (25% above the mean and 25% below the mean).

Working with quantitative data



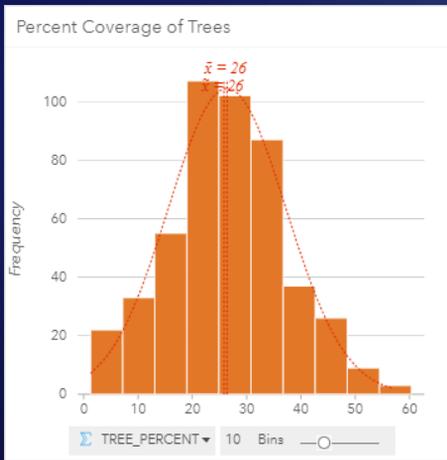
Histogram



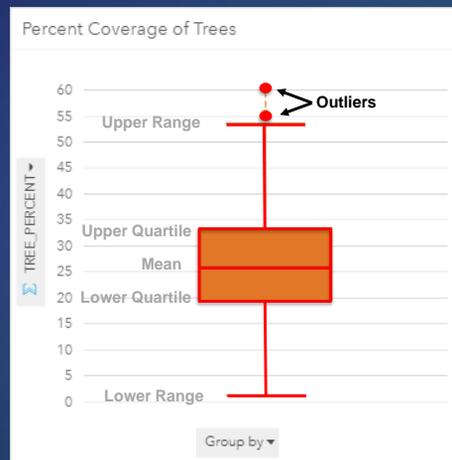
Box Plot

The vertical line is the expected range ...

Working with quantitative data



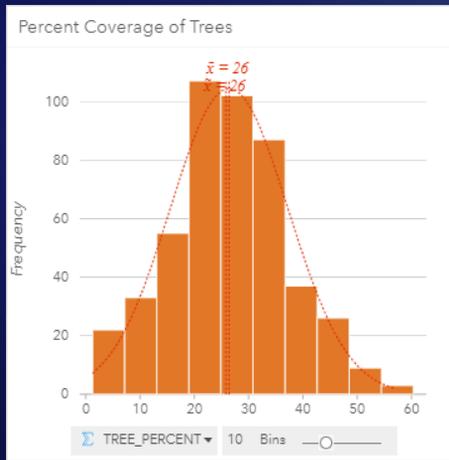
Histogram



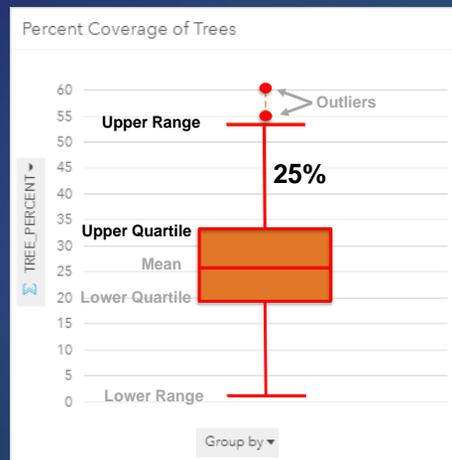
Box Plot

... and the dots represent the upper and lower range of any statistical outliers.

Working with quantitative data



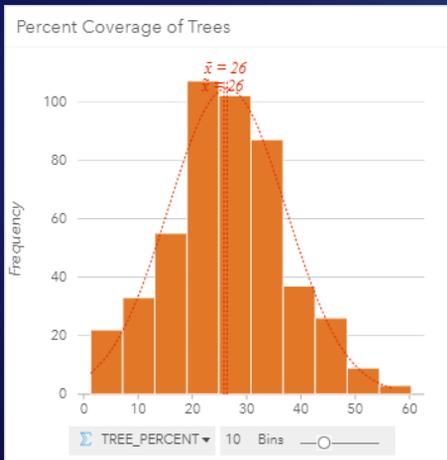
Histogram



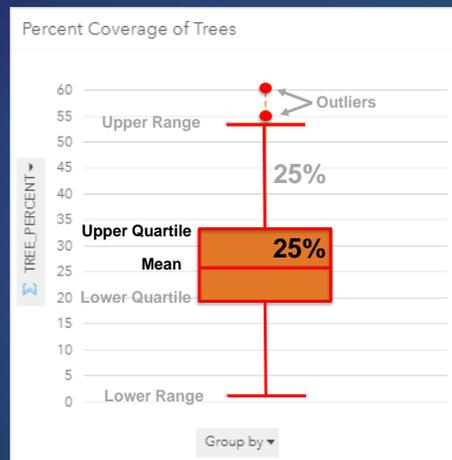
Box Plot

If you exclude the outliers, the values between the Upper Quartile and the Upper Range are in the top 25% of the data.

Working with quantitative data



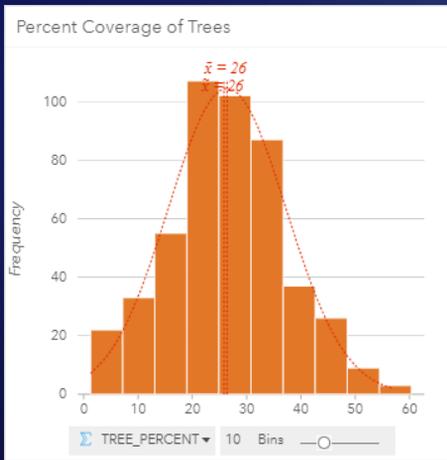
Histogram



Box Plot

The values between the Mean and the Upper Quartile make up another 25% of the data ...

Working with quantitative data



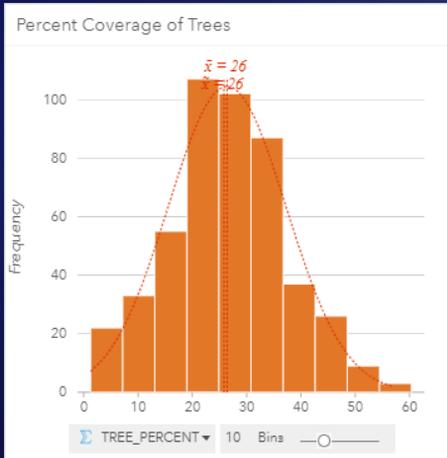
Histogram



Box Plot

... and so on.

Working with quantitative data



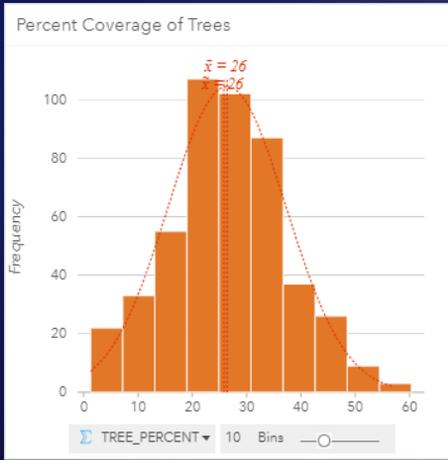
Histogram



Box Plot

<click>

Working with quantitative data



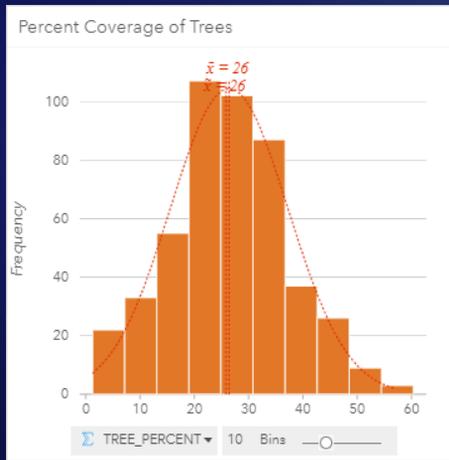
Histogram



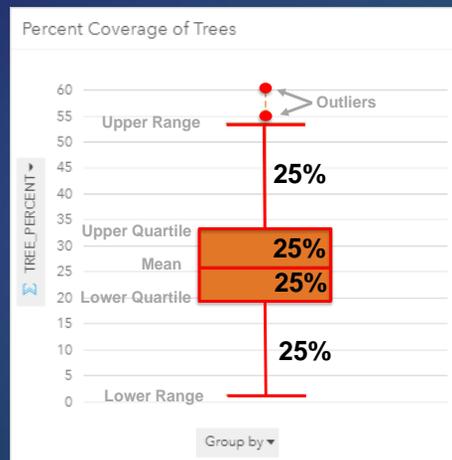
Box Plot

<click>

Working with quantitative data



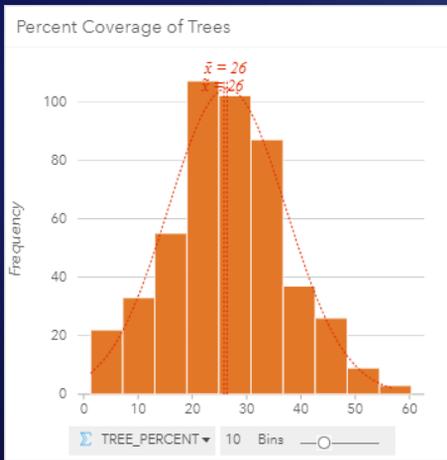
Histogram



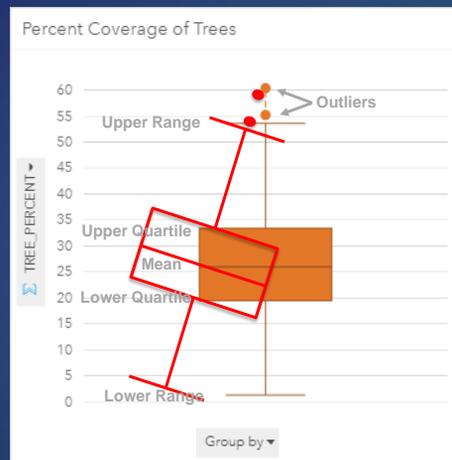
Box Plot

As you can see, the box plot divides the data, excluding the outliers, into four evenly sized groups.

Working with quantitative data



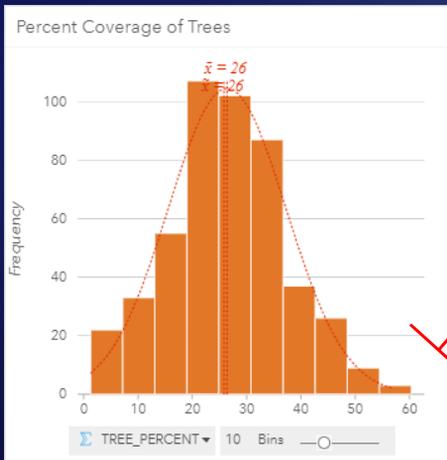
Histogram



Box Plot

Let's overlay the two charts...

Working with quantitative data



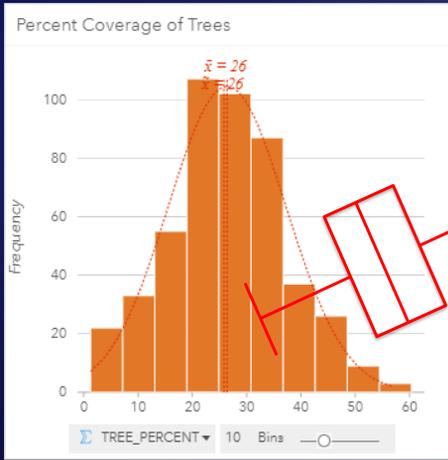
Histogram



Box Plot

We can visualize the box plot superimposed on a histogram.

Working with quantitative data



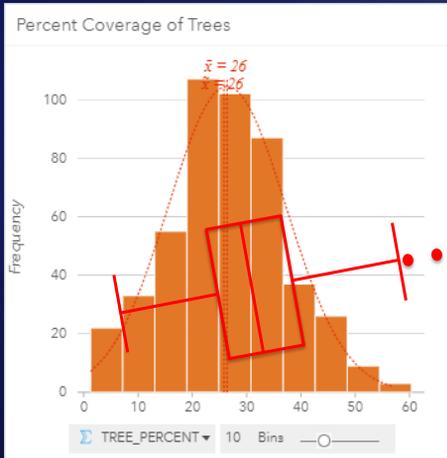
Histogram



Box Plot

<click>

Working with quantitative data



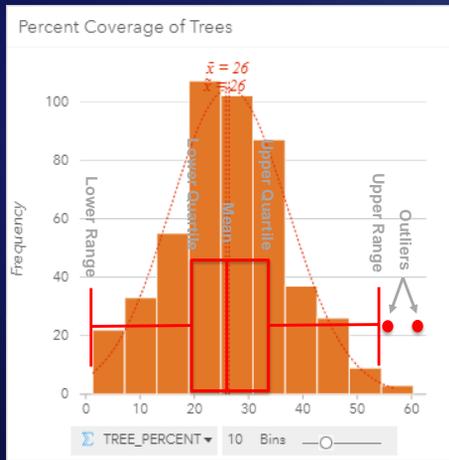
Histogram



Box Plot

<click>

Working with quantitative data



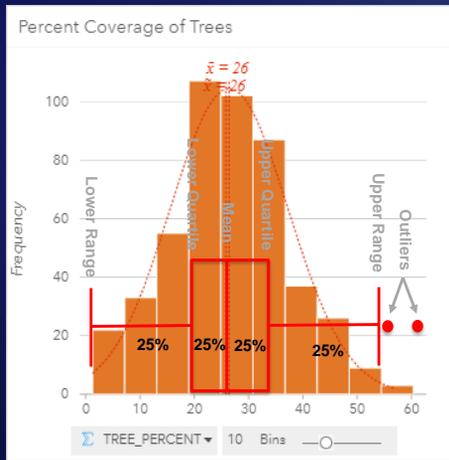
Histogram



Box Plot

The box plot is a less detailed, but simpler way of showing the same kind of information that is on a histogram

Working with quantitative data



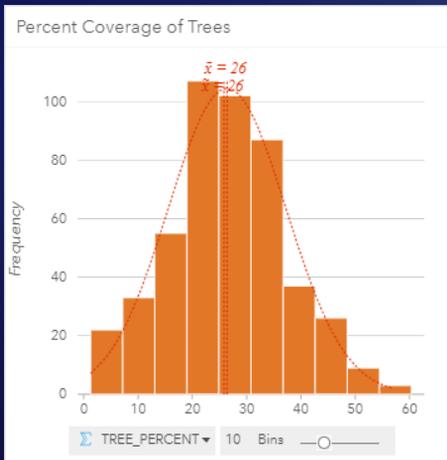
Histogram



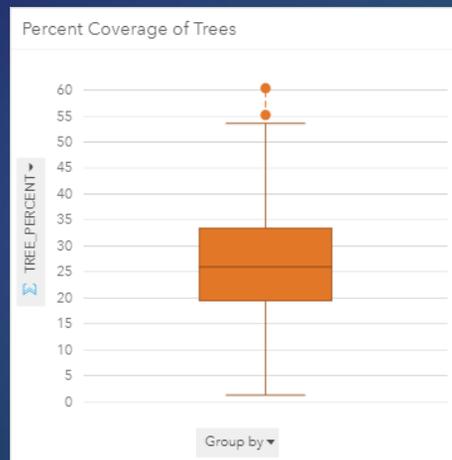
Box Plot

The box plot is a less detailed, but simpler way of showing the same kind of information that is on a histogram

Working with quantitative data



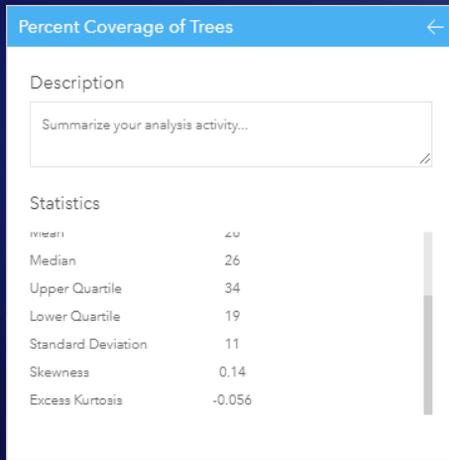
Histogram



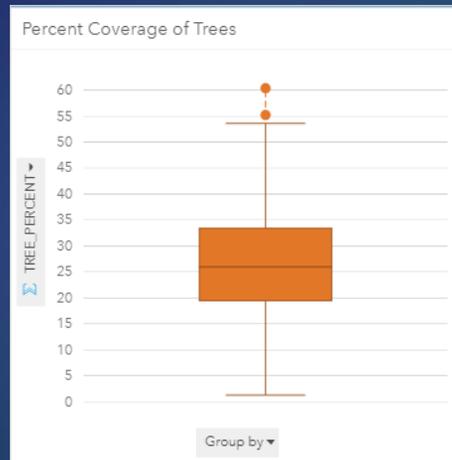
Box Plot

You can flip the cards over ...

Working with quantitative data



Histogram

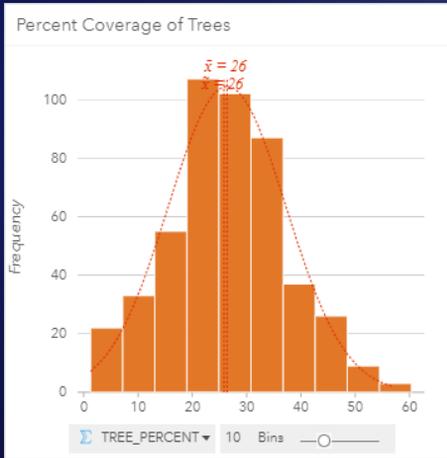


Box Plot

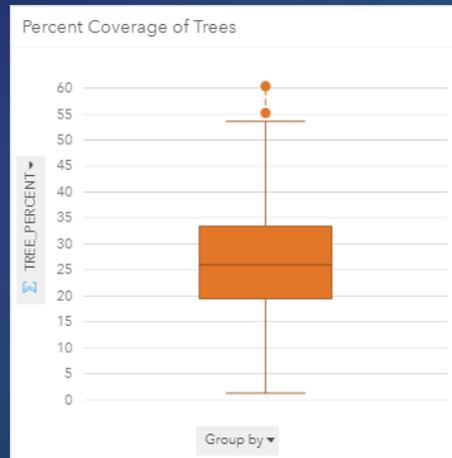
... to get various statistics.

For example, skewness and kurtosis measure how well the histogram resembles a bell curve, or normal distribution.

Working with quantitative data



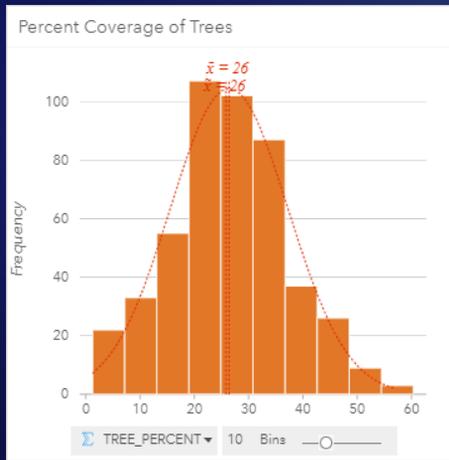
Histogram



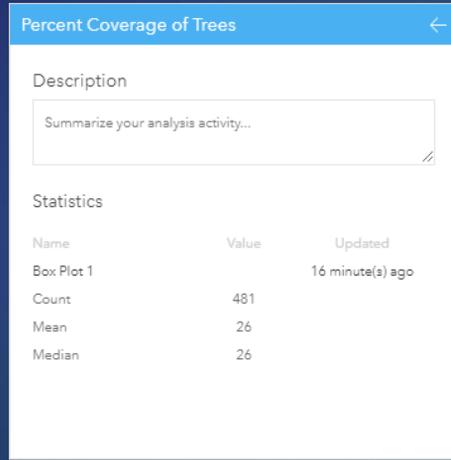
Box Plot

<click>

Working with quantitative data



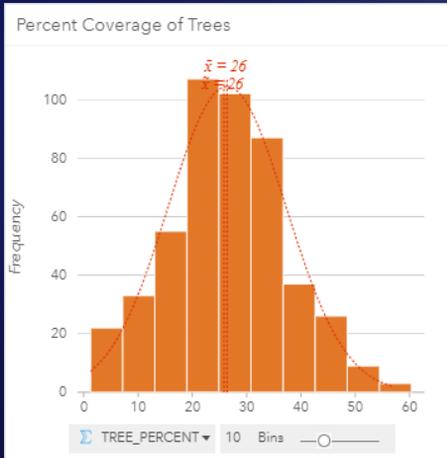
Histogram



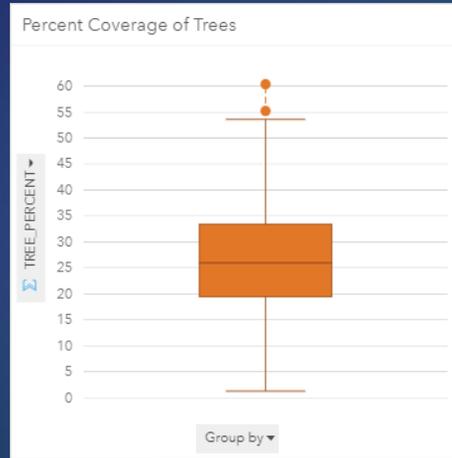
Box Plot

Here is the back side of the box plot card.

Working with quantitative data



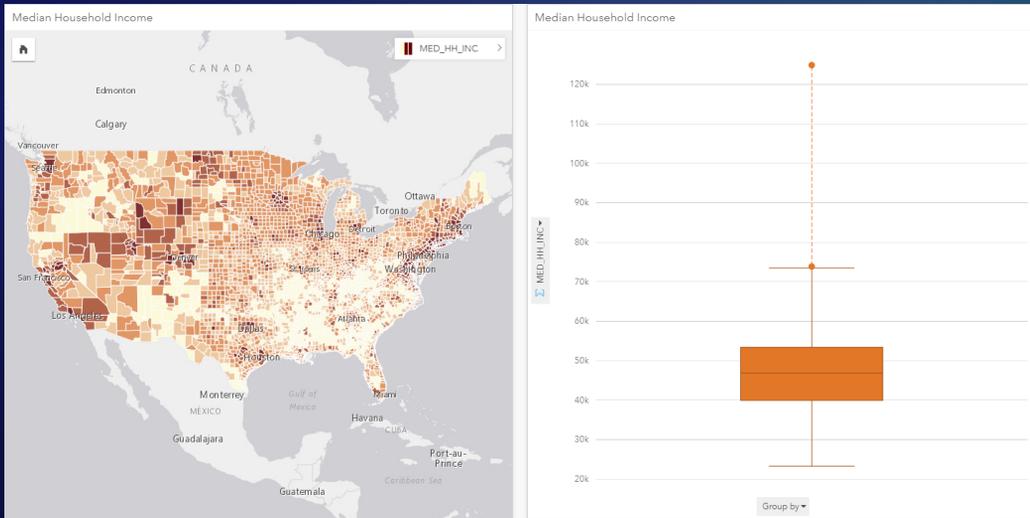
Histogram



Box Plot

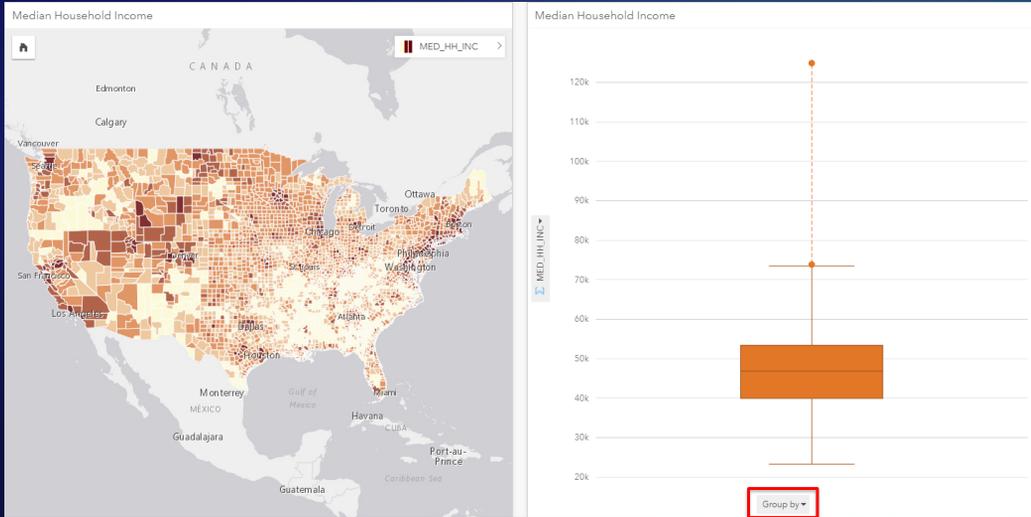
<click>

Working with quantitative data



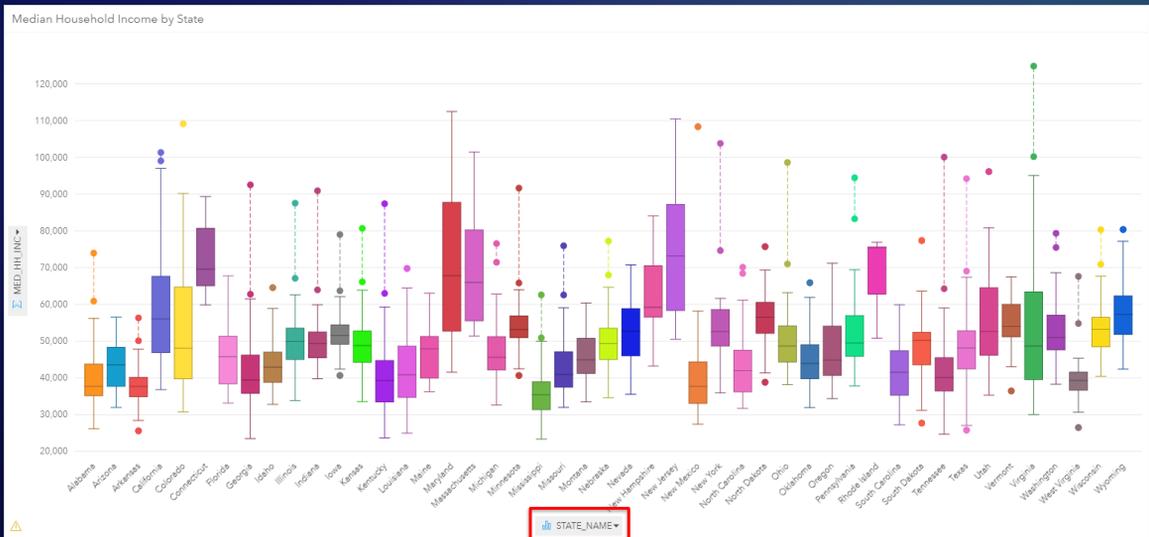
Box plots are useful for comparisons.
These cards both show Median Household Income for each county in the United States.

Working with quantitative data



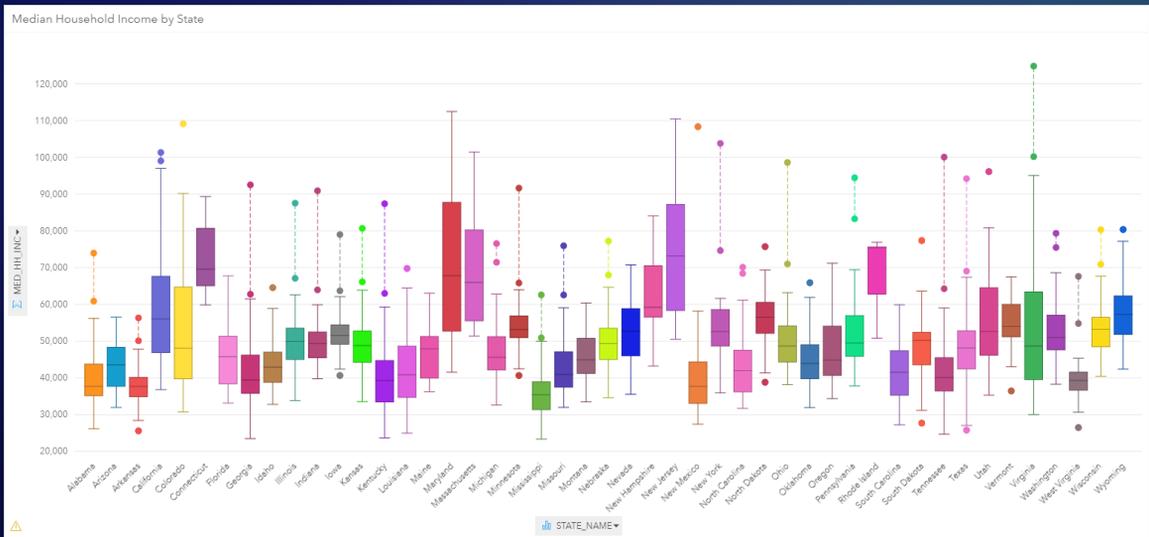
If we group the county-level Median Household Income by State Name ...

Working with quantitative data



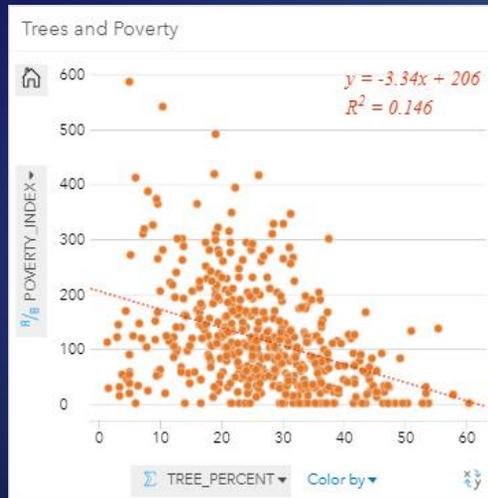
We are able to compare Median Household Incomes between different states.

Working with quantitative data



Each box plot shows the distribution of income levels within one state. The higher the box, the higher the income. The bigger the box, the higher the income disparity between different counties within the state. This card reveals a large disparity in median household income between states. It also appears that the richer states also tend to have wider ranges of incomes.

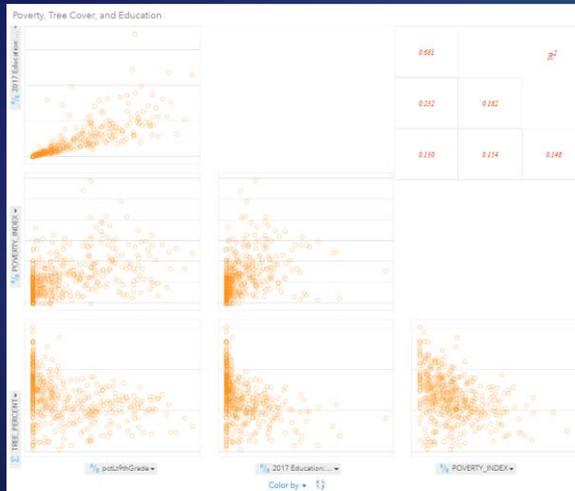
Working with quantitative data



Scatter Plot

Another useful chart for numeric data is the Scatter Plot. Here we are comparing poverty to percent tree coverage, and we see that as tree coverage goes up, there appears to be a tendency for poverty to go down.

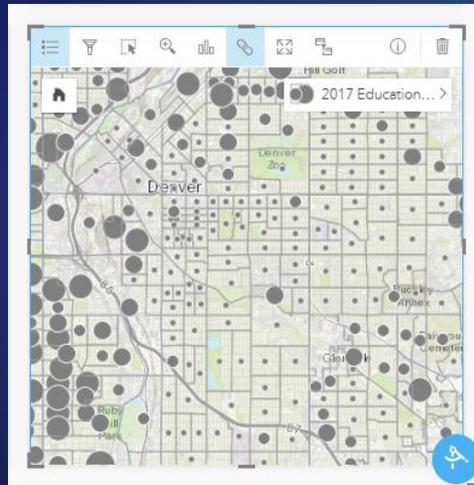
Working with quantitative data



Scatter Plot Matrix

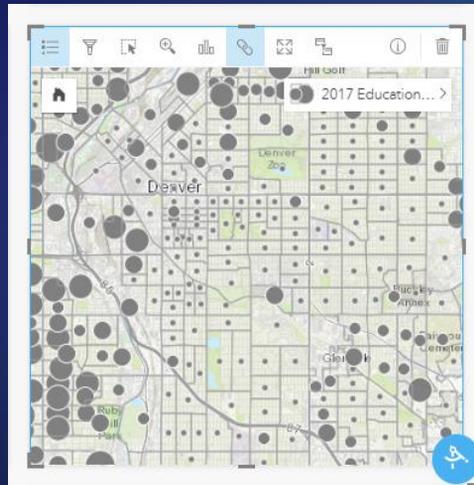
You can quickly explore for trends using a Scatter Plot Matrix. Here we are looking for relationships between all possible pairs of Poverty, Tree Cover, and Educational attainment.

Analytics



Perhaps the most powerful feature of Insights is the Action Button.

Analytics



← Action button

This button opens a rich palette of analytic geoprocessing tools to perform Spatial Aggregation, Proximity, Drive Time, Regression, Data Enrichment, and more.

Analytics

Find answers

Spatial tools

How is it distributed?

How is it related?

What's nearby?

How has it changed?

The analytics are organized by the kind of question

Analytics

Find answers	Spatial tools
How is it distributed?	
How is it related?	
What's nearby?	
How has it changed?	

For each type of question ...

Analytics

Find answers Spatial tools

How is it distributed?

How is it related?

What's nearby?

How has it changed?

How is it distributed?

- Spatial Aggregation
- Calculate Density
- View Histogram
- Classification
- View Heat Chart
- View Box Plot
- Calculate Z-Score

What's nearby?

- Create Buffer/Drive Times
- Create Attribute Filter
- Spatial Filter
- Find Nearest

How has it changed?

- Time Series
- Calculate % Change
- View Data Clock

How is it related?

- Enrich Data
- View Scatter Plot
- Calculate Ratio
- View Chord Diagram
- View Link Chart
- Create Regression Model
- Predict Variable

There is a collection of analytics.

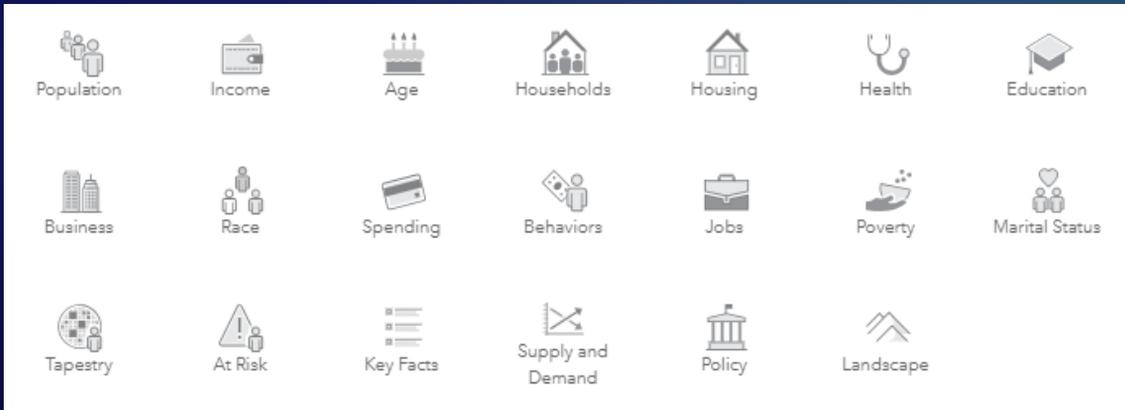
Analytics

The image displays a central menu titled "Find answers" with a "Spatial tools" tab. The menu lists four questions: "How is it distributed?", "How is it related?", "What's nearby?", and "How has it changed?". Surrounding this menu are four panels of analytics tools:

- How is it distributed?**: Spatial Aggregation, Calculate Density, View Histogram, Classification, View Heat Chart, View Box Plot, Calculate Z-Score.
- What's nearby?**: Create Buffer/Drive Times, Create Attribute Filter, Spatial Filter, Find Nearest.
- How has it changed?**: Time Series, Calculate % Change, View Data Clock.
- How is it related?**: Enrich Data (highlighted with a red box), View Scatter Plot, Calculate Ratio, View Chord Diagram, View Link Chart, Create Regression Model, Predict Variable.

Enrichment is an analytic that adds attributes to your features.

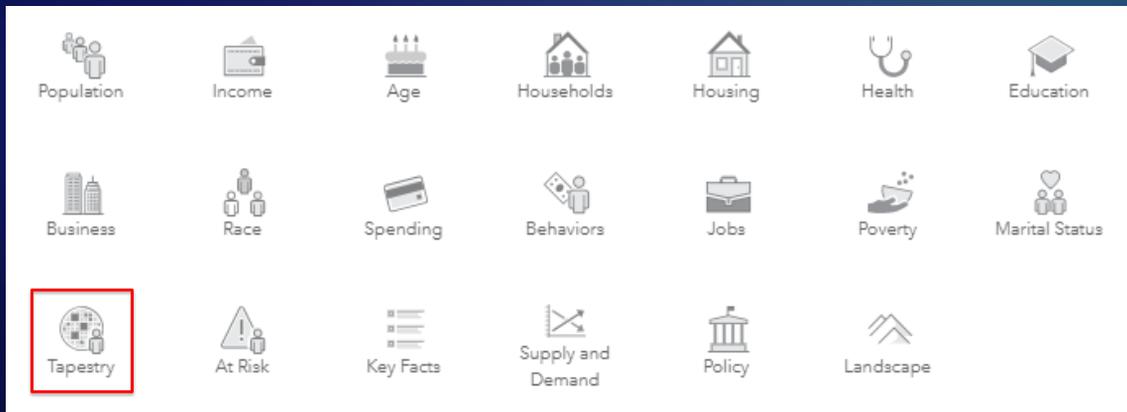
Analytics



Data enrichment

The Data Enrichment tool adds attributes to your point or area data by getting facts about the people, places, and businesses that surround your data locations. It enables you to answer questions about locations such as:

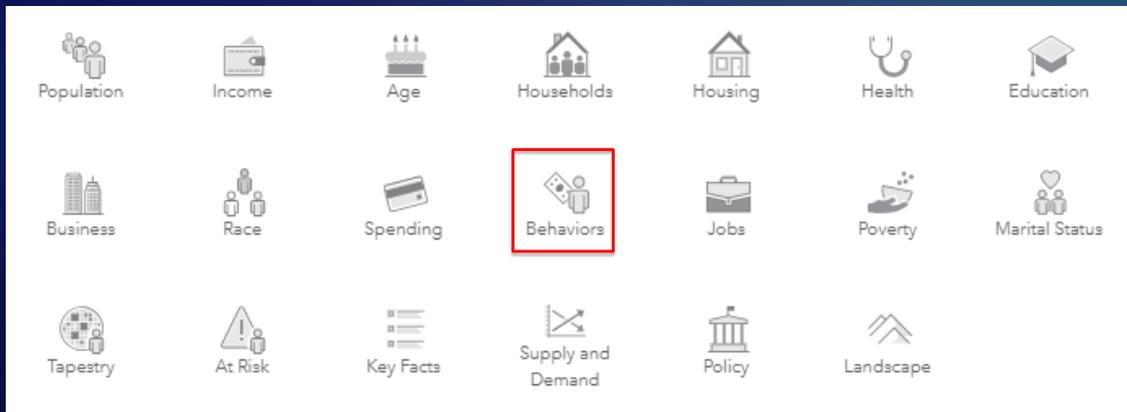
Analytics



Data enrichment

What kind of neighborhood is it?

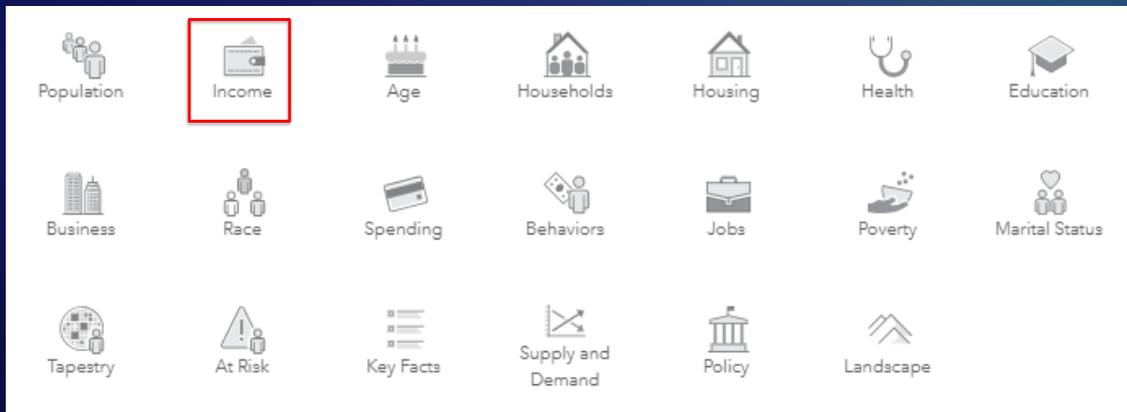
Analytics



Data enrichment

What do people like to do in this area?

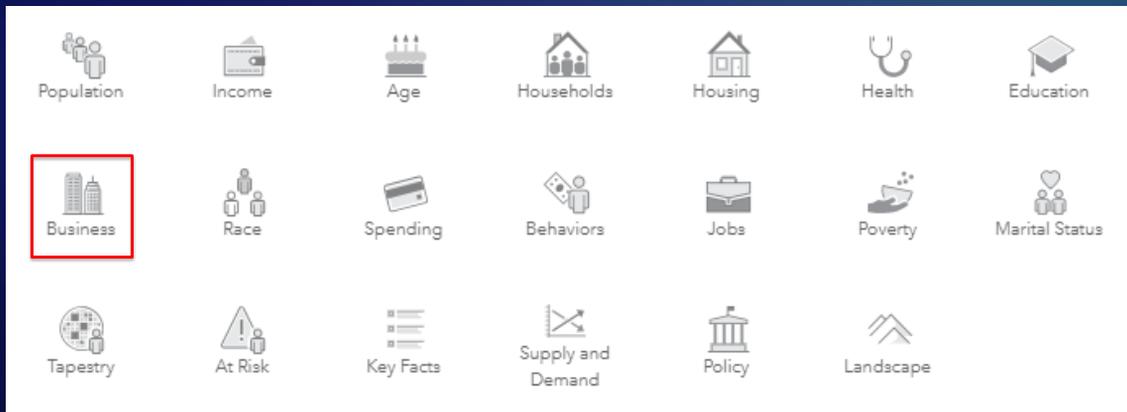
Analytics



Data enrichment

How much money do they earn?

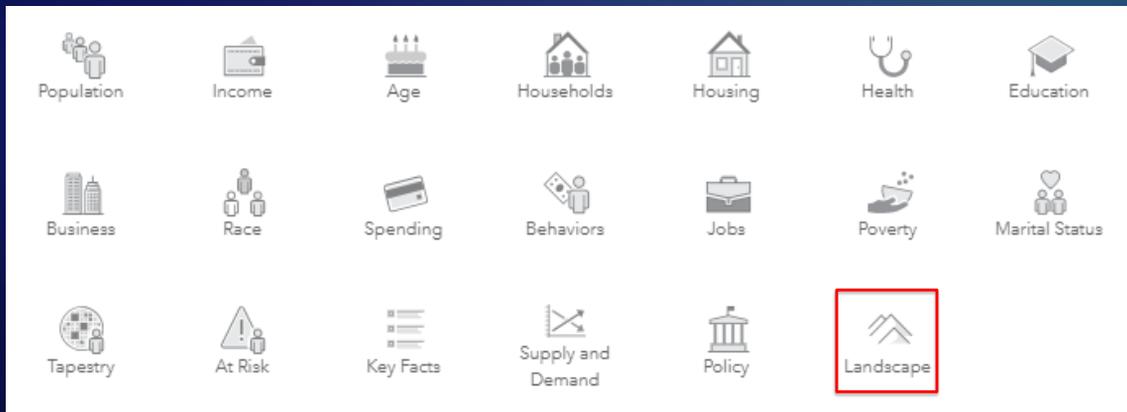
Analytics



Data enrichment

What kind of businesses are here?

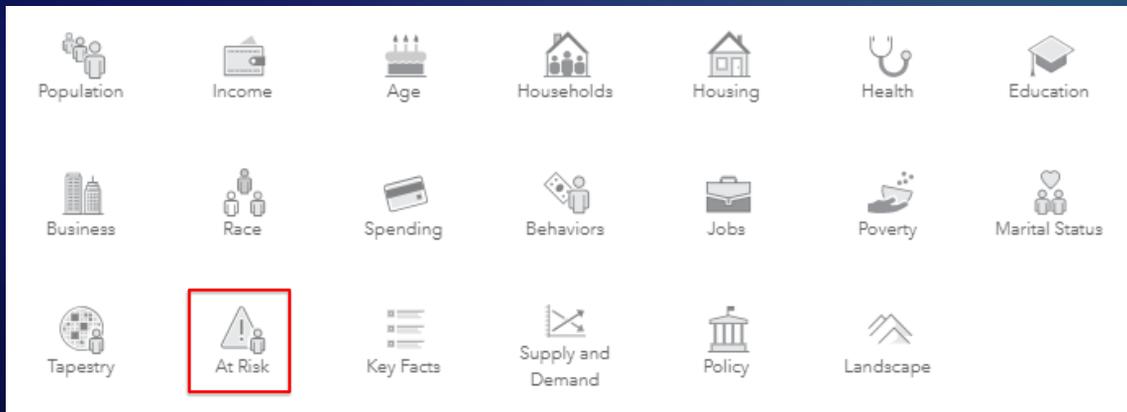
Analytics



Data enrichment

What is the percent tree coverage at this location?

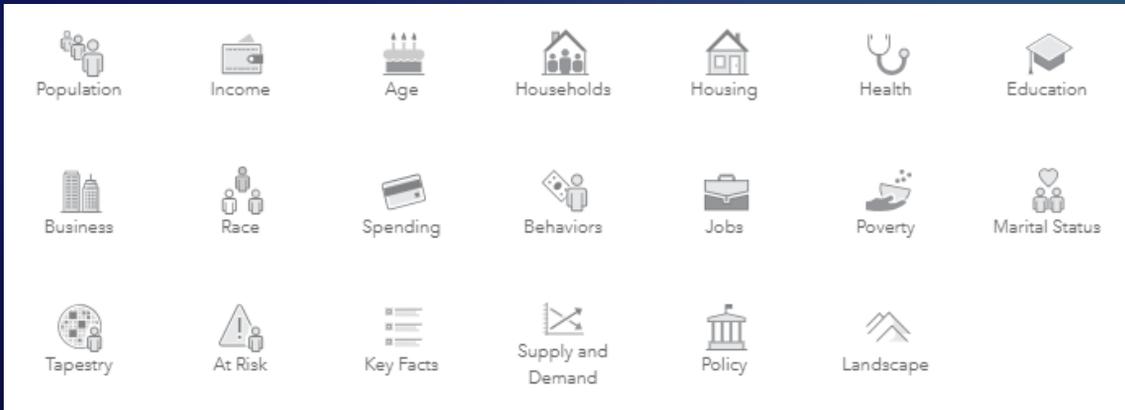
Analytics



Data enrichment

What is the flood risk?

Analytics



Data enrichment

The Data Enrichment tool adds attributes to your point or area data by getting facts about the people, places, and businesses that surround your data locations. It enables you to answer questions about locations such as: What kind of neighborhood is it? What do people like to do in this area? How much money do they earn? What kind of businesses are here? What is the percent tree coverage at this location? What is the flood risk?

Top 5 tips and tricks

Insights for ArcGIS



Now that you have seen what Insights for ArcGIS can do, here are 5 tips and tricks for using it effectively.

Top 5 tips and tricks

1. **Provide meaningful names for Workbooks, Pages, Cards, Datasets, and Fields**

If you name things as you go, you can stay organized, and your work will be more clear to others.

Top 5 tips and tricks

1. Provide meaningful names for Workbooks, Pages, Cards, Datasets, and Fields
2. **Change field roles to correctly represent the *INFORMATION* they contain**

Make sure your data is being used properly by assigning each field to the correct role.

Top 5 tips and tricks

1. Provide meaningful names for Workbooks, Pages, Cards, Datasets, and Fields
2. Change field roles to correctly represent the *INFORMATION* they contain
3. **Use filters and grouping to narrow down your focus**

Slice up your data using filters, and categorize it using grouping.

Top 5 tips and tricks

1. Provide meaningful names for Workbooks, Pages, Cards, Datasets, and Fields
2. Change field roles to correctly represent the *INFORMATION* they contain
3. Use filters and grouping to narrow down your focus
4. **Share a results layer to use it in Pro or other apps**

Top 5 tips and tricks

1. Provide meaningful names for Workbooks, Pages, Cards, Datasets, and Fields
2. Change field roles to correctly represent the *INFORMATION* they contain
3. Use filters and grouping to narrow down your focus
4. Share a results layer to use it in Pro or other apps
5. **Occasionally back up your workbook by duplicating it**

Save often, and duplicate your workbook occasionally to keep a running series of backups.

Top 5 tips and tricks

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Insights for ArcGIS





End