Level Up Your Spatial Vizzes

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How is it distributed?
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The basic starting point for most spatial analytics is the visual analysis of

*where is it?*

*and*

*how does it change across the map?*

There are many ways to explore distributions in Tableau – and each will tell you a different part of the story of your spatial data.
Point distribution
Spatial bins - square
Spatial bins - square

• Calculated field to round the latitude and longitude values to specified number of decimal places
• Snaps all points to a square-ish grid
• Symbolize as squares

```sql
// Round to 1/10 of a decimal degree
round([Longitude], 1)
```
Spatial bins - square

- Number used in rounding determines size of grid
  - Rounding to 1 (1/10\textsuperscript{th} degree) – left
  - Rounding to 0 (nearest degree) - right
Spatial bins - hexagonal

- Several ways to do this in Tableau (e.g., hexbinx and hexbiny in calculated fields)
- I like the spatial join method
  - Hex grid created in QGIS
  - Point data as spatial file
  - Intersect in Tableau
Custom geographies

• Spatial join to connect custom spatial boundary files to point data
Heatmaps for quick, ordinal aggregation

- Density mark type (new in 2018.3)
Each method for looking at distribution tells a slightly different story.
How does it change?
If you have a temporal dimension – try Pages

• Show change in attribute over time with a date or time on Pages
How far away is it?
Set actions to drive distance calculations

- Frequent question – how many {stores, customers, oil wells} are within {distance}?
- Set action + calculated field allows click to select location, automatic update of what locations are within distance
  - Selection can also be used to drive update to tables / charts on a dashboard
Set action set-up

• Create a one location set
• Create a set action to update the location in the set
• Calculated fields to:
  • Grab latitude and longitude for selected location
  • Assign location to all other rows in the table
  • Calculate distance from selected location to all other locations
  • Filter or color encode to identify which locations are within a specified distance
What is there?
What is there?

The question isn’t always about overall pattern or distribution
Sometimes we need to dig into particular locations for more detail…

Going *beyond the map* is a great way to add context for exploring your data
What is there?

Dashboard with Google Streetview
Streetview setup

- Web page with a bit of javascript to connect to Google Streetview
- URL Action in Tableau to send location to web page
- Web page on dashboard to show result
Copy the HTML, add in your Google API key

https://sarahbat.github.io/streetview.html
Analytics in SQL Server
Florence demo
Data setup

- Process data in SQL server
- Union multiple timesteps of data together (not necessary, but this lets us look at time series)
- Join Census attributes
- Join FIPS codes with county names
Where did the data come from?

- NOAA National Hurricane Center (forecasts every 6 hours)
- US Census population attributes

Processing in SQL Server
- Import the data
- Query to intersect storm polygons and Census tracts
- Geography can be brought into Tableau directly
What benefit does this give us?

• Any analytics available in SQL Server can be used

• Can go beyond the current point / polygon intersection feature in Tableau
  • We’re using polygon / polygon intersection to crack the polygon geometry in SQL Server!

• Allows for more precision – can proportionally assign impacted population based on how the tract intersects different storm polygons
The data we can work with

- Storm polygons, Census tracts, and the intersection of the two
What can we do with it?

• Impact by county
  • Could be a map, list of counties impacted, list of emergency operations contacts, shelter capacity, etc.
What can we do with it?

• Dig into impacted populations
• Link map with auxiliary visualizations
What can we do with it?

- Quick summary visualizations

Florence
Tropical Storm Force Wind Speed Probabilities Within Next 120 Hours
(date of dataset: 2018091100)

Date/Time of Forecast
2018091100

Total population impacted
3,442,867

Total counties impacted
55

Households impacted
1,660,197

Housing units
1,985,762
What can we do with it?

And all sorts of other ways of visualizing the data

The sky is the limit with analytical possibilities!
More detail? Check Tableau Public

https://public.tableau.com/profile/sarah.battersby#!/

Look for the files that start with TC18