

DataScience for Development and Social Change, 2015

Communicating Data

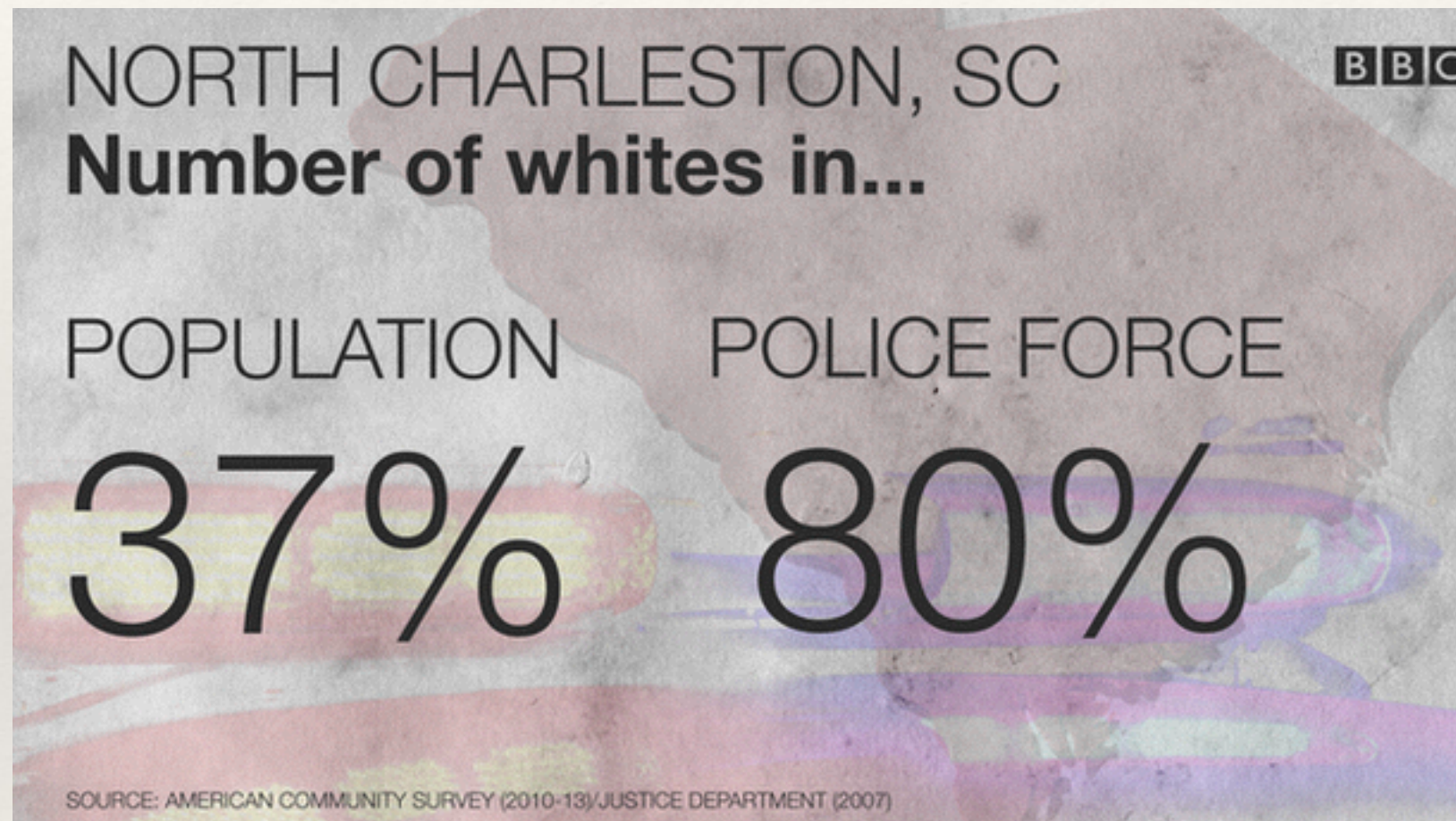
Getting your data's message
across

Communication

- ❖ Engage
- ❖ Persuade
- ❖ Inform
- ❖ Entertain

"I already knew that increased incarceration didn't lower crime, but I wasn't sure of the statistics. To see it on the graphs is really eye opening."

Doesn't have to be complex



Doesn't have to be “standard”



Choosing Tools

- ❖ Questions to help choose:
 - ❖ Standard visualisations, or something special?
 - ❖ Which languages (arabic, mandarin etc)?
 - ❖ Interactive or static?
 - ❖ CSV only, or takes different input types?
 - ❖ Tabular data or maps (or both)?

Tools

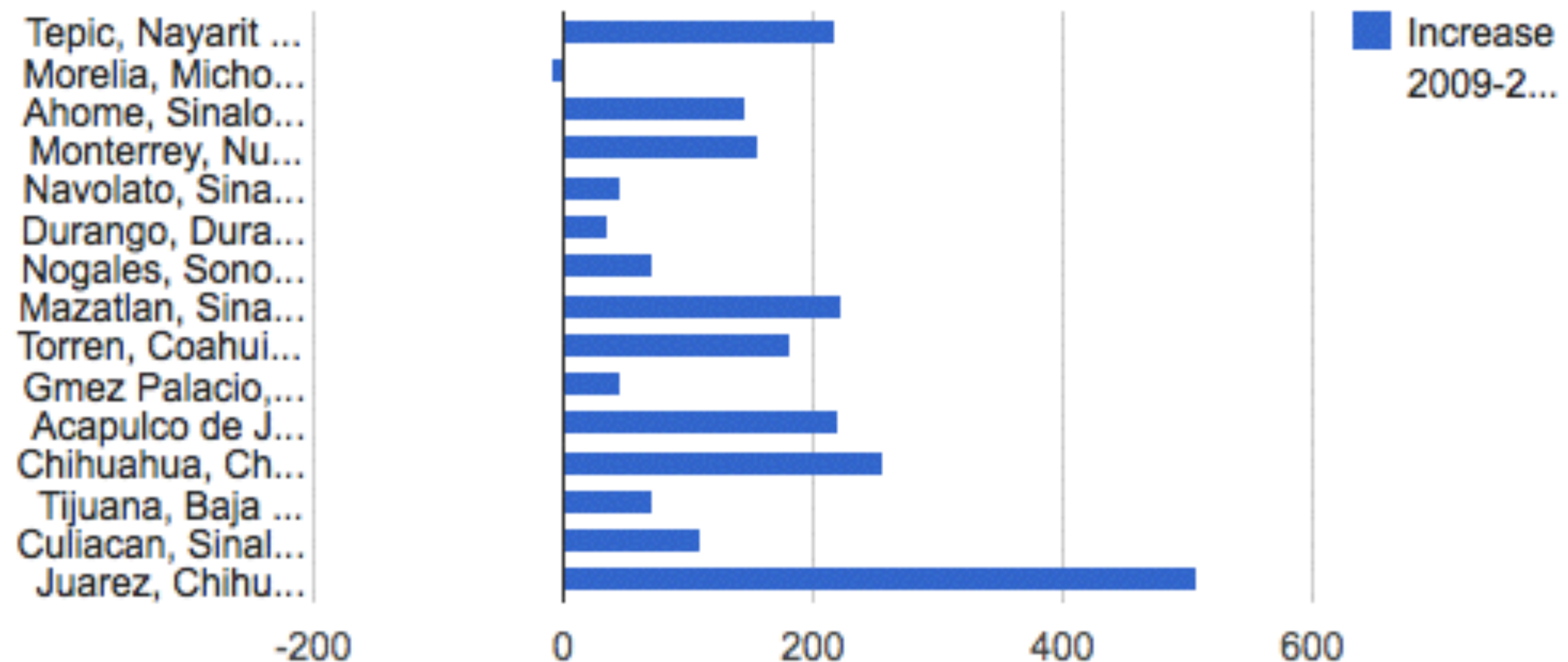
- ❖ Tables:

- ❖ Excel
- ❖ Tableau
- ❖ Google Fusion Tables
- ❖ HighCharts
- ❖ D3

- ❖ Maps:

- ❖ QGIS
- ❖ CartoDB
- ❖ MapBox

Tools: Google Fusion Tables



(link to google spreadsheets)

Tableau

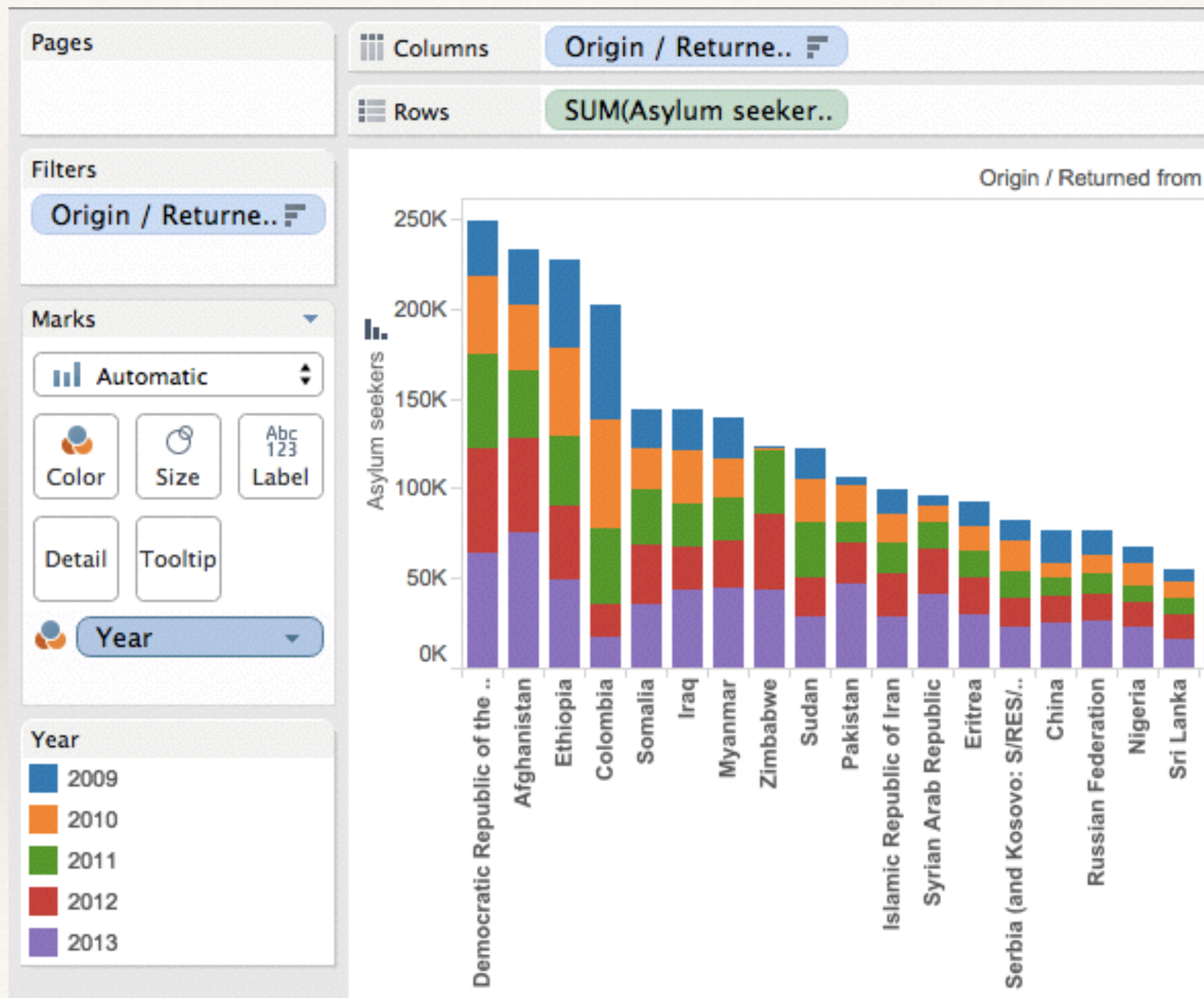
- ❖ Tableau Public

- ❖ Free
- ❖ Excel or text (CSV) import only
- ❖ Needs online connection

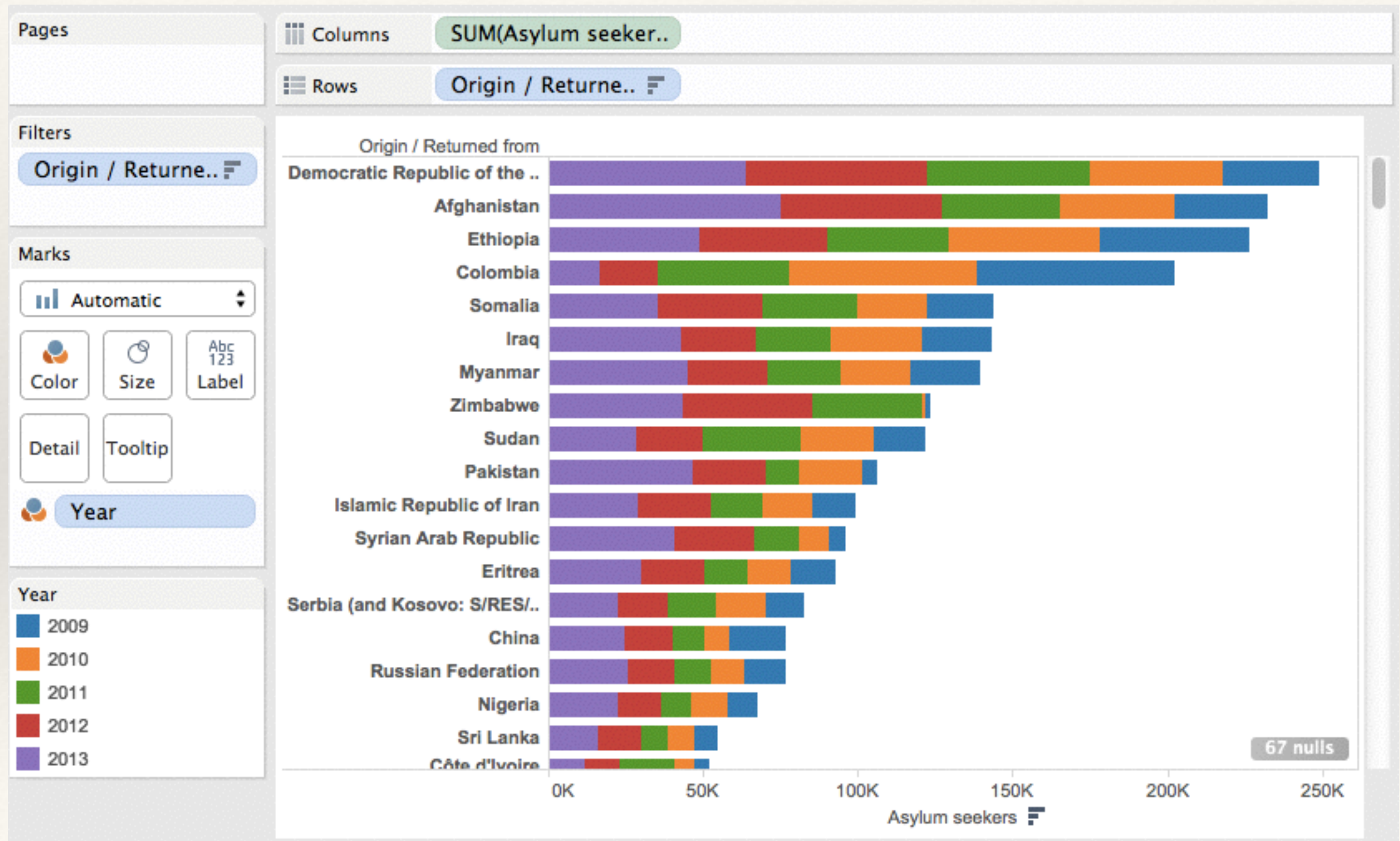
- ❖ Tableau Desktop

- ❖ Not free (but free to students who ask)
- ❖ Range of import formats and datastore APIs
- ❖ Works offline

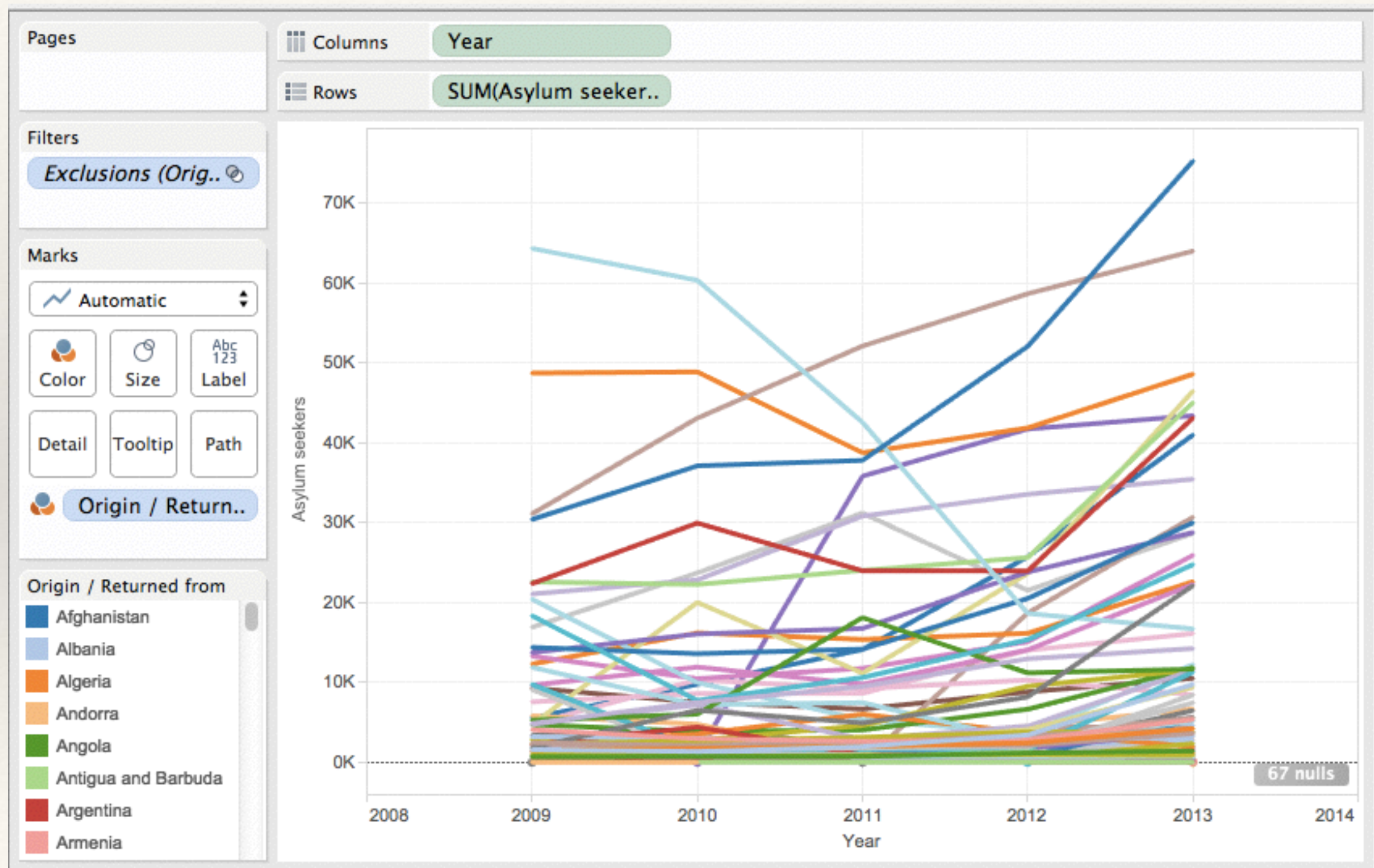
We already made a column chart



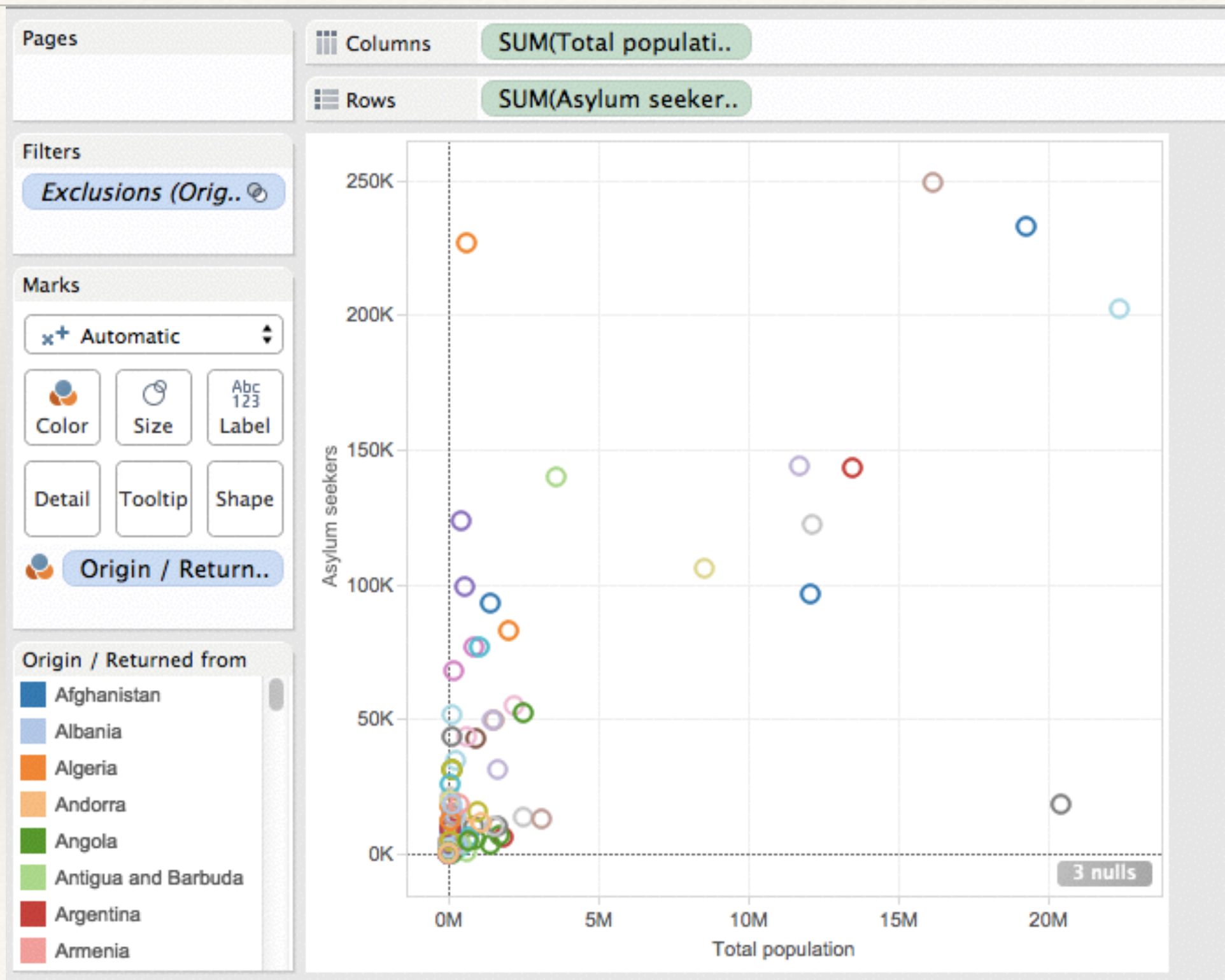
Bar Chart



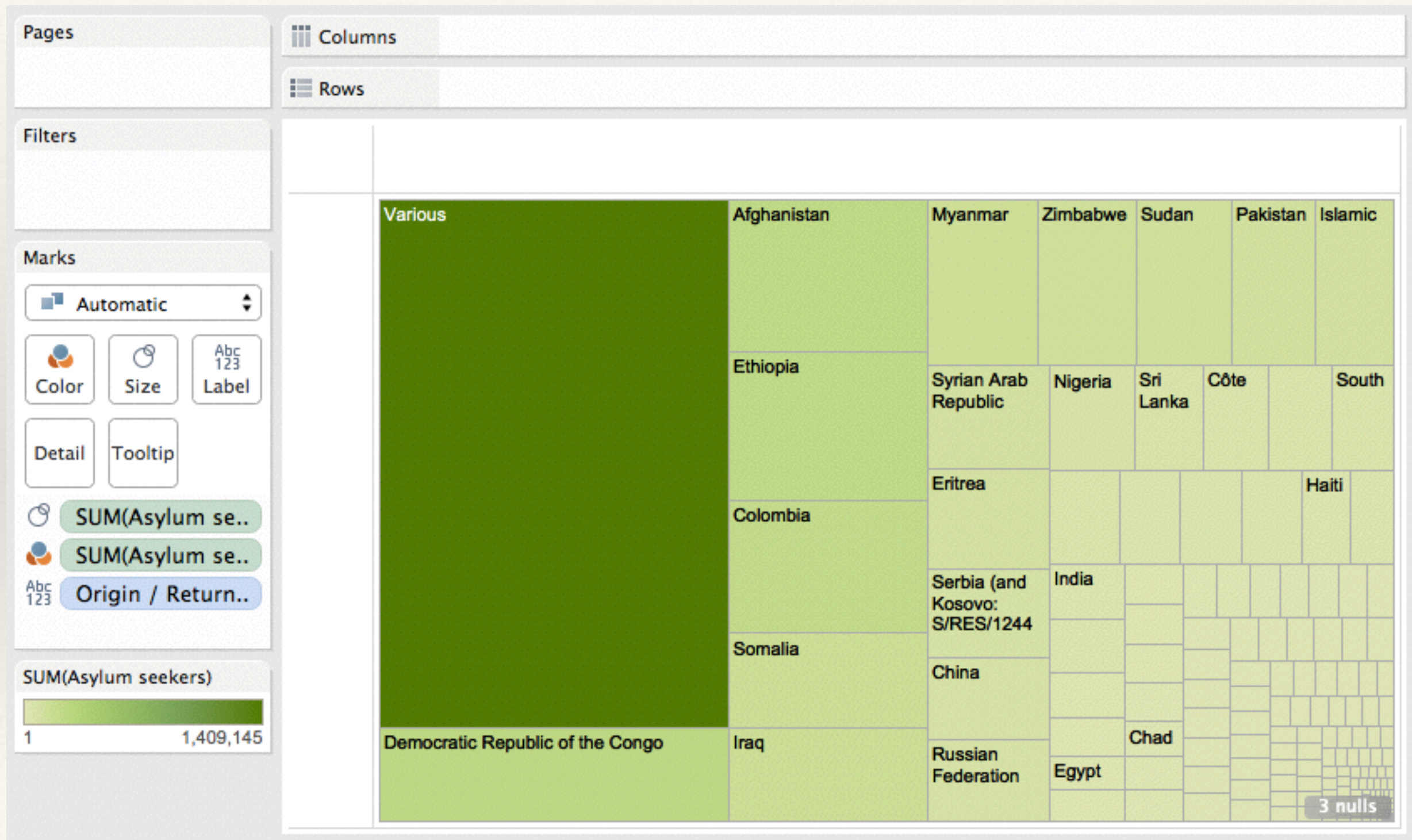
Line Chart



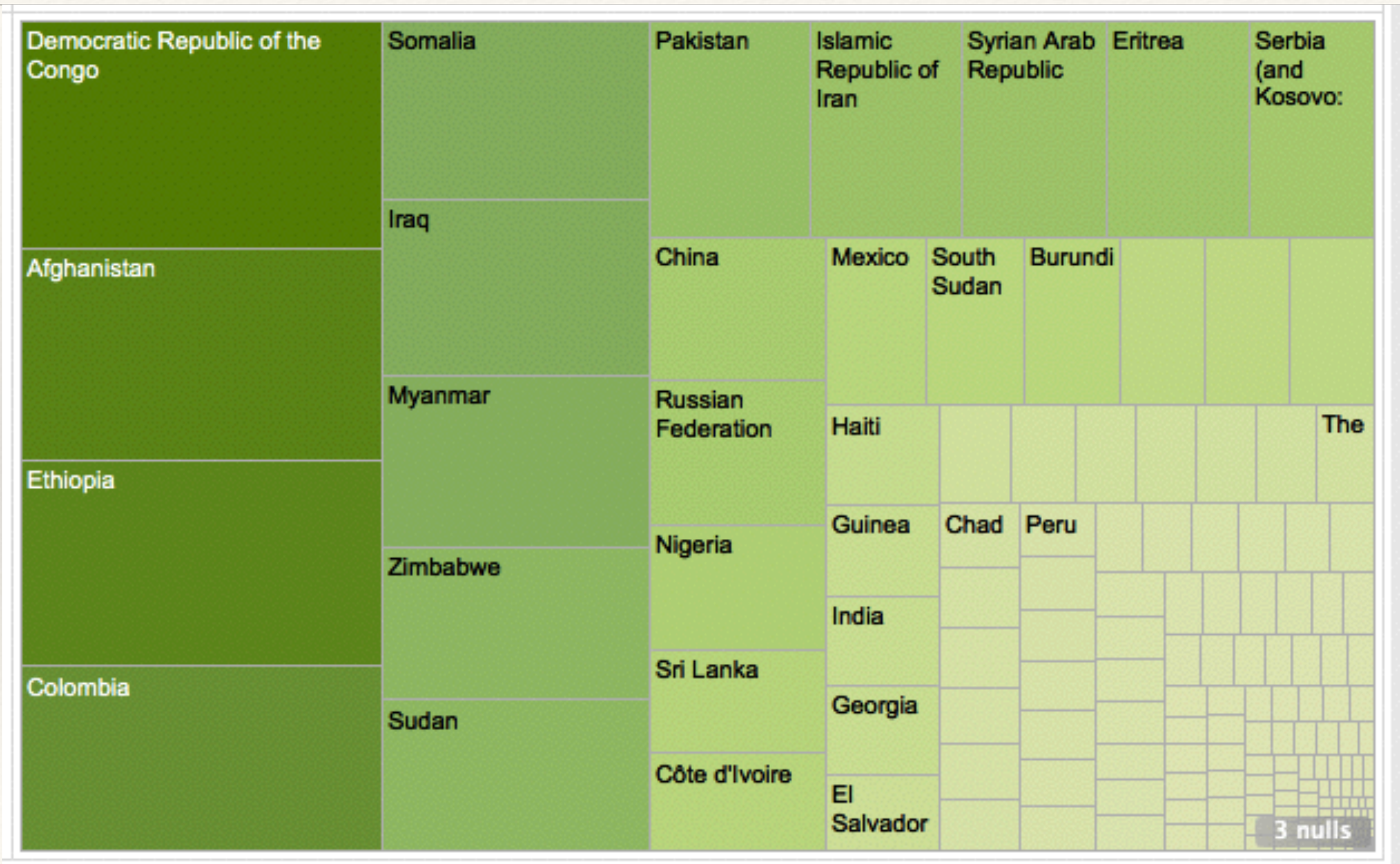
Scatterplot



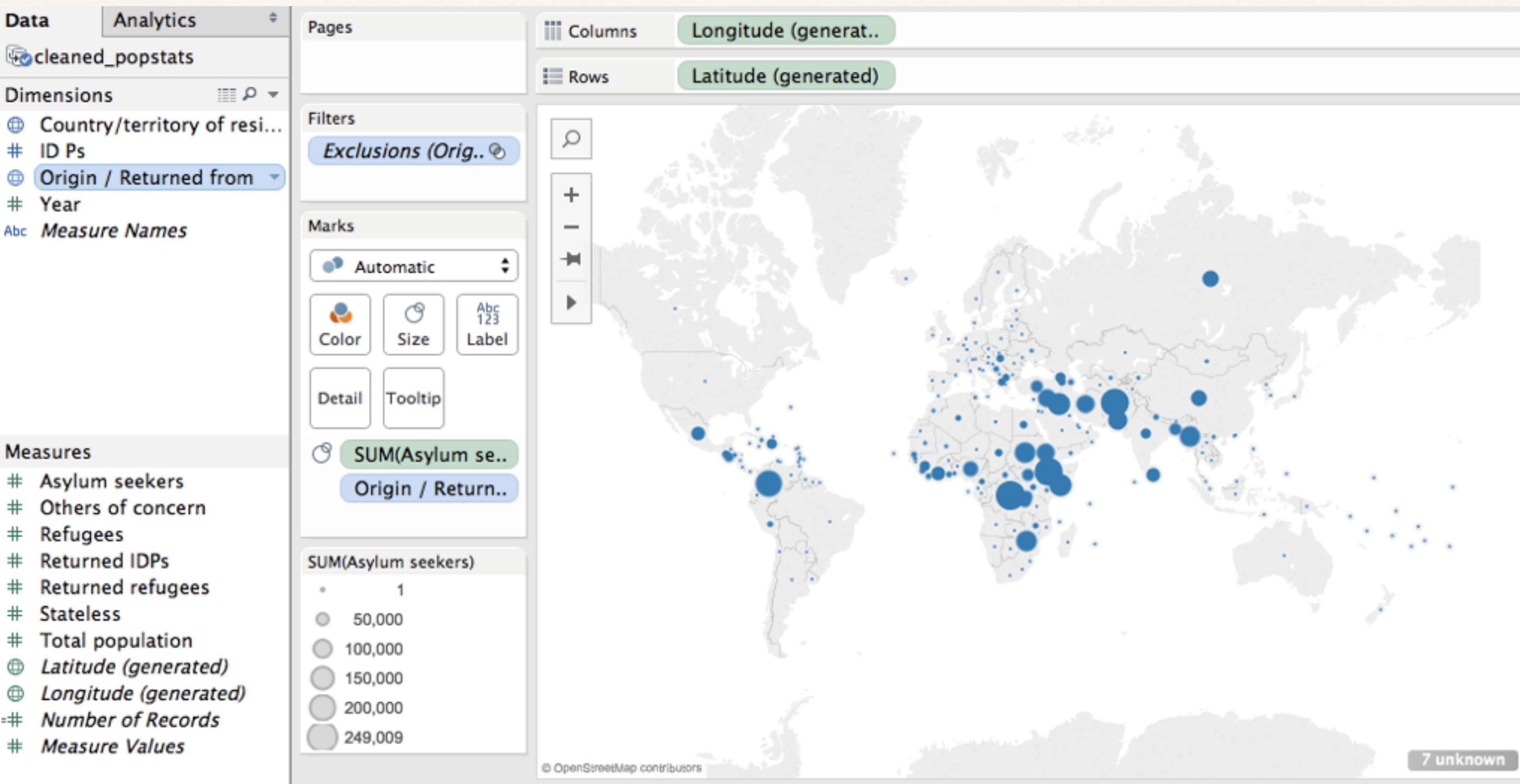
TreeMap



TreeMap with Exclusions



Symbol Map



Choropleth (“filled map”)

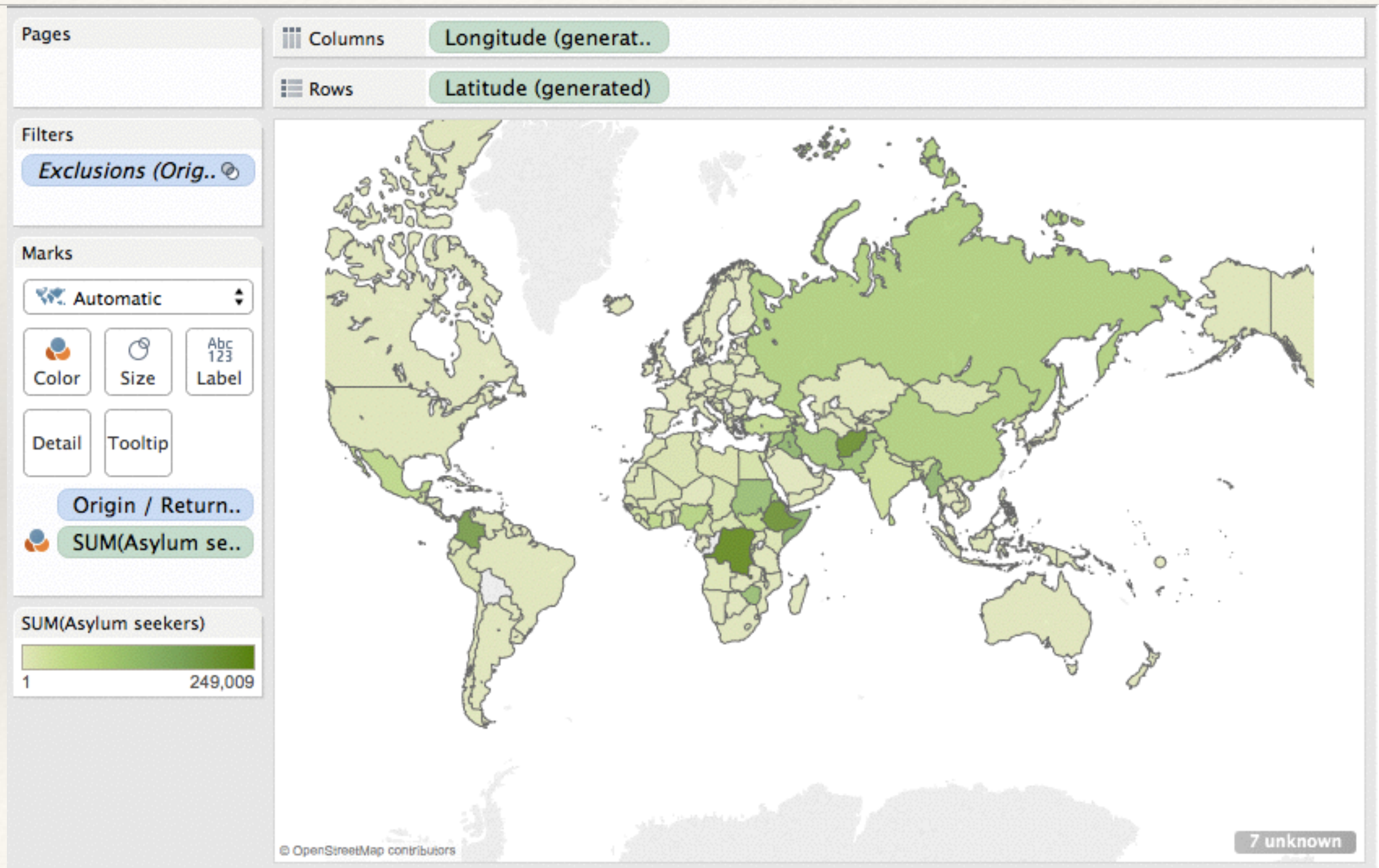
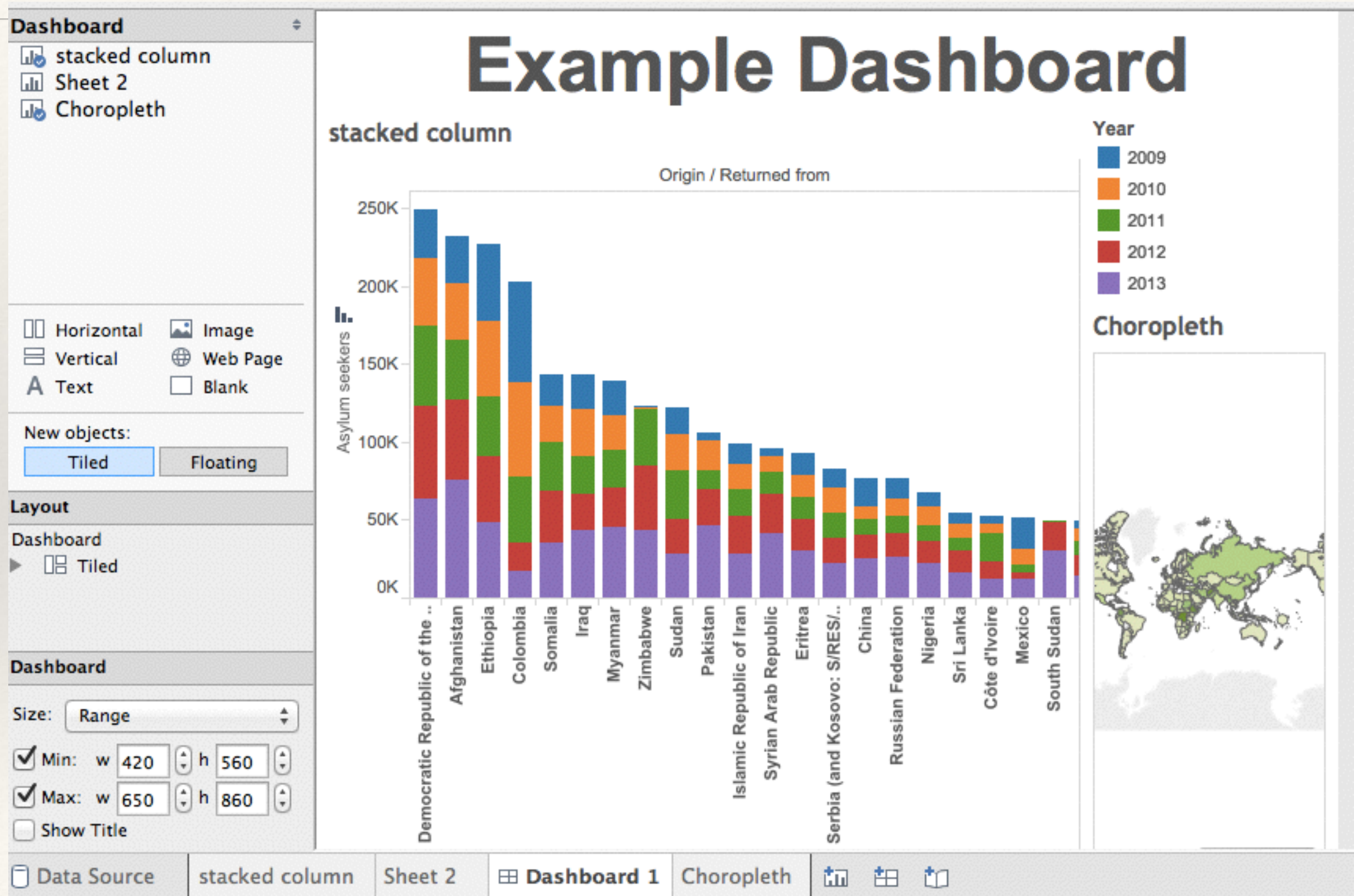


Tableau Dashboards



What's that visualisation?

A PERIODIC TABLE OF VISUALIZATION METHODS

 C continuum	Data Visualization Visual representations of quantitative data in schematic form (either with or without axes)										 Strategy Visualization The systematic use of complementary visual representations in the analysis, development, formulation, communication, and implementation of strategies in organizations.										 G graphic facilitation																																																		
 Tb table	 Ca cartesian coordinates	Information Visualization The use of interactive visual representations of data to amplify cognition. This means that the data is transformed into an image; it is mapped to screen space. The image can be changed by users as they proceed working with it.										 Metaphor Visualization Visual Metaphors position information graphically to organize and structure information. They also convey an insight about the represented information through the key characteristics of the metaphor that is employed.										 Compound Visualization The complementary use of different graphic representation formats in one single schema or frame.										 Me meeting trace	 Mm metro map	 Tm temple	 St story template	 Tr tree	 Ct cartoon																																		
 Pi pie chart	 L line chart	Concept Visualization Methods to elaborate (mostly) qualitative concepts, ideas, plans, and analyses.										 Co communication diagram										 Fp flight plan										 Cs concept skeleton										 Br bridge										 Fu funnel										 Ri rich picture									
 B bar chart	 Ac area chart	 R radar chart cobweb	 Pa parallel coordinates	 Hy hyperbolic tree	 Cy cycle diagram	 T timeline	 Ve venn diagram	 Mi mindmap	 Sq square of oppositions	 Cc concentric circles	 Ar argument slide	 Sw swim lane diagram	 Gc gantt chart	 Pm perspectives diagram	 D dilemma diagram	 Pr parameter ruler	 Kn knowledge map																																																						
 Hi histogram	 Sc scatterplot	 Sa sankey diagram	 In information lens	 E entity relationship diagram	 Pt petri net	 Fl flow chart	 Cl clustering	 Lc layer chart	 Py minot pyramid technique	 Ce cause-effect chains	 Tl toulmin map	 Dt decision tree	 Cp qpm critical path method	 Cf concept fan	 Co concept map	 Ic iceberg	 Lm learning map																																																						
 Tk tukey box plot	 Sp spectrogram	 Da data map	 Tp treemap	 Cn cone tree	 Sy system dyn / simulation	 Df data flow diagram	 Se semantic network	 So soft system modeling	 Sn synergy map	 Fo force field diagram	 Ib ibis argumentation map	 Pr process event chains	 Pe pert chart	 Ev evocative knowledge map	 V Vee diagram	 Hh heisen's bell chart	 I informal																																																						






Note: Depending on your location and connection speed it can take some time to load a pop-up picture.





























version 1.5

© Ralph Lengler & Martin J. Eppler, www.visual-literacy.org

Cy **Process Visualization**

Hy Structure Visualization

-  **Overview**
-  **Detail**
-  **Detail AND Overview**
-  **Divergent thinking**
-  **Convergent thinking**

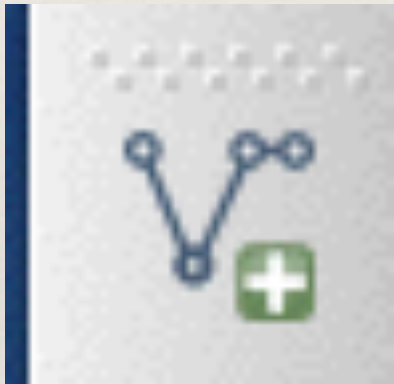
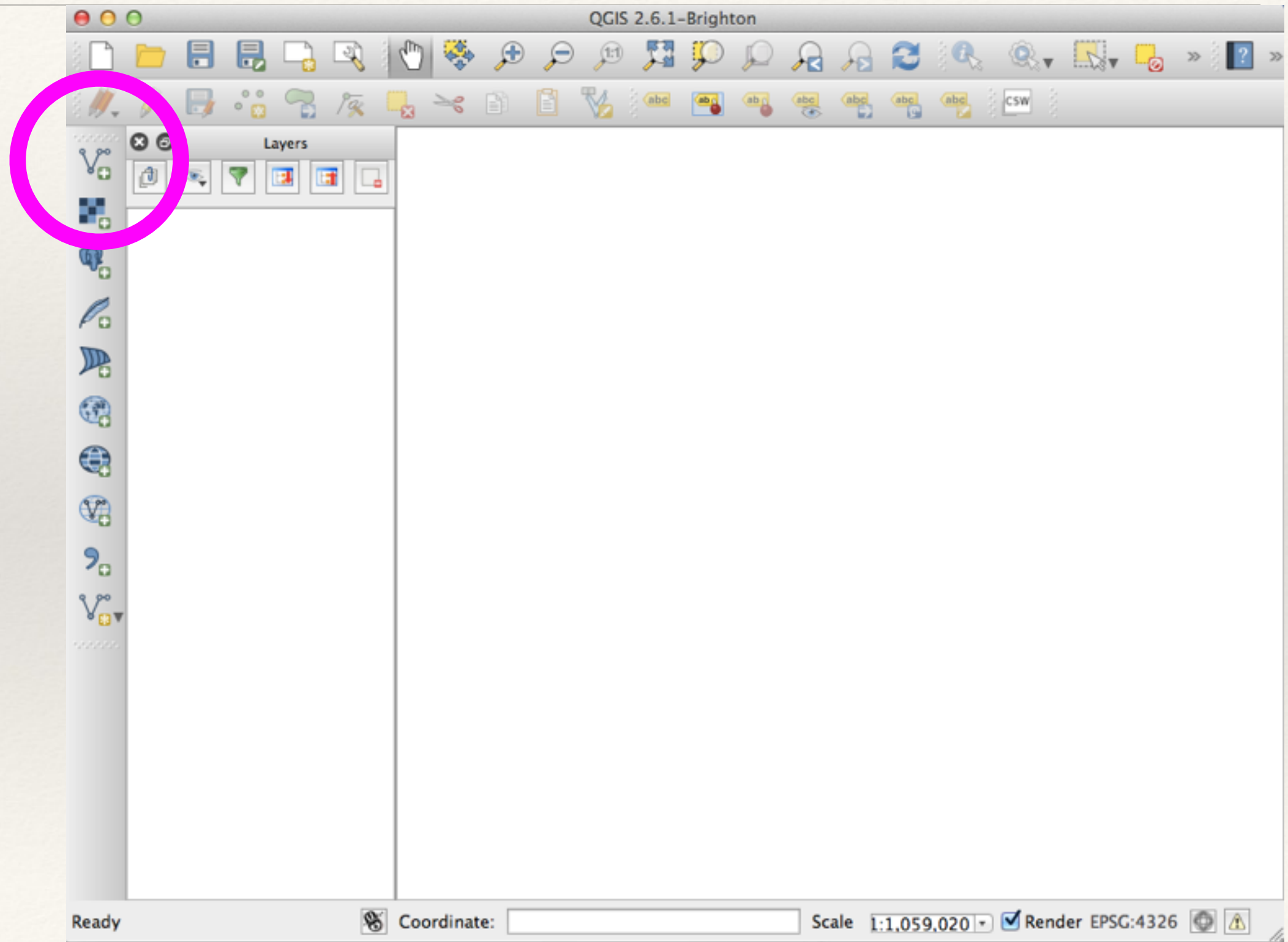
 Su supply demand curve	 Pc performance charting	 St strategy map	 Oc organisation chart	 Ho house of quality	 Fd feedback diagram	 Ft failure tree	 Mq magic quadrant	 Ld life-cycle diagram	 Po porter's five forces	 S s-cycle	 Sm stakeholder map	 Is ishikawa diagram	 Tc technology roadmap
 Ed edgeworth box	 Pf portfolio diagram	 Sg strategic game board	 Mz mintzberg's organigraph	 Z zwicky's morphological box	 Ad affinity diagram	 De decision discovery diagram	 Bm bcg matrix	 Stc strategy canvas	 Vc value chain	 Hy hype-cycle	 Sr stakeholder rating map	 Ta taps	 Sd spray diagram

http://www.visual-literacy.org/periodic_table/periodic_table.html

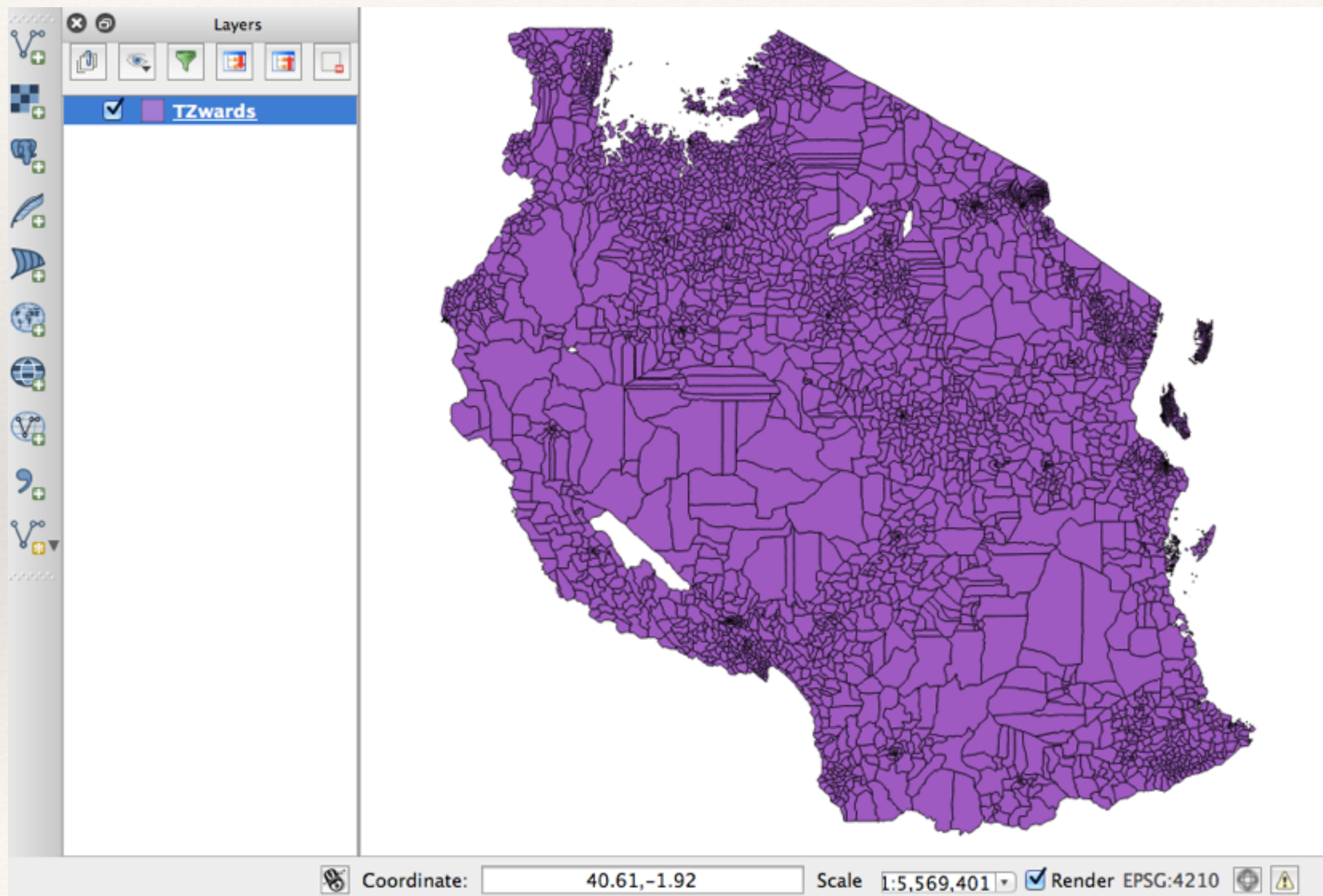
QGIS

- ❖ Map viewer
- ❖ But also has data tools hidden inside

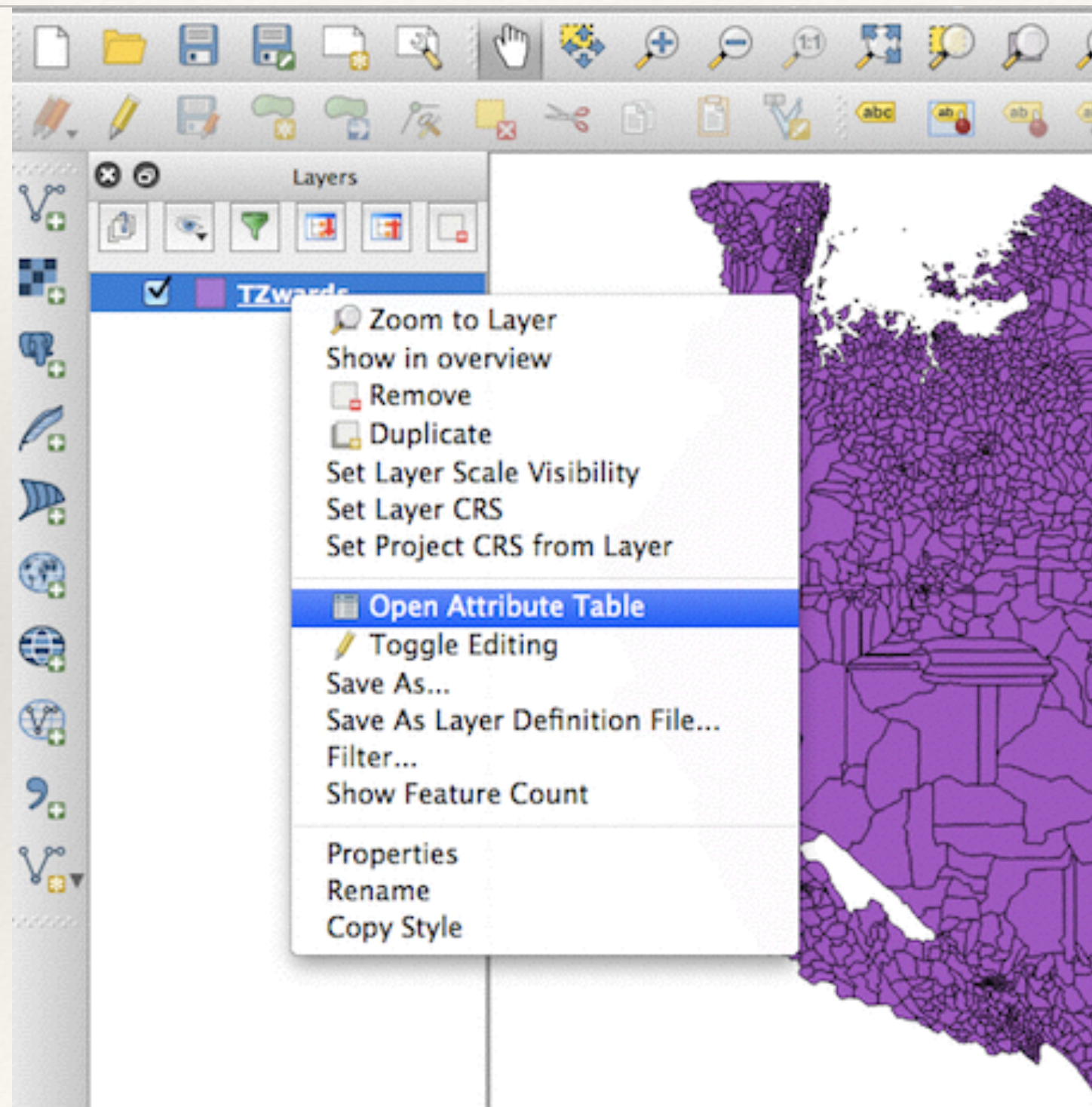
Shapefiles



Tanzania Wards



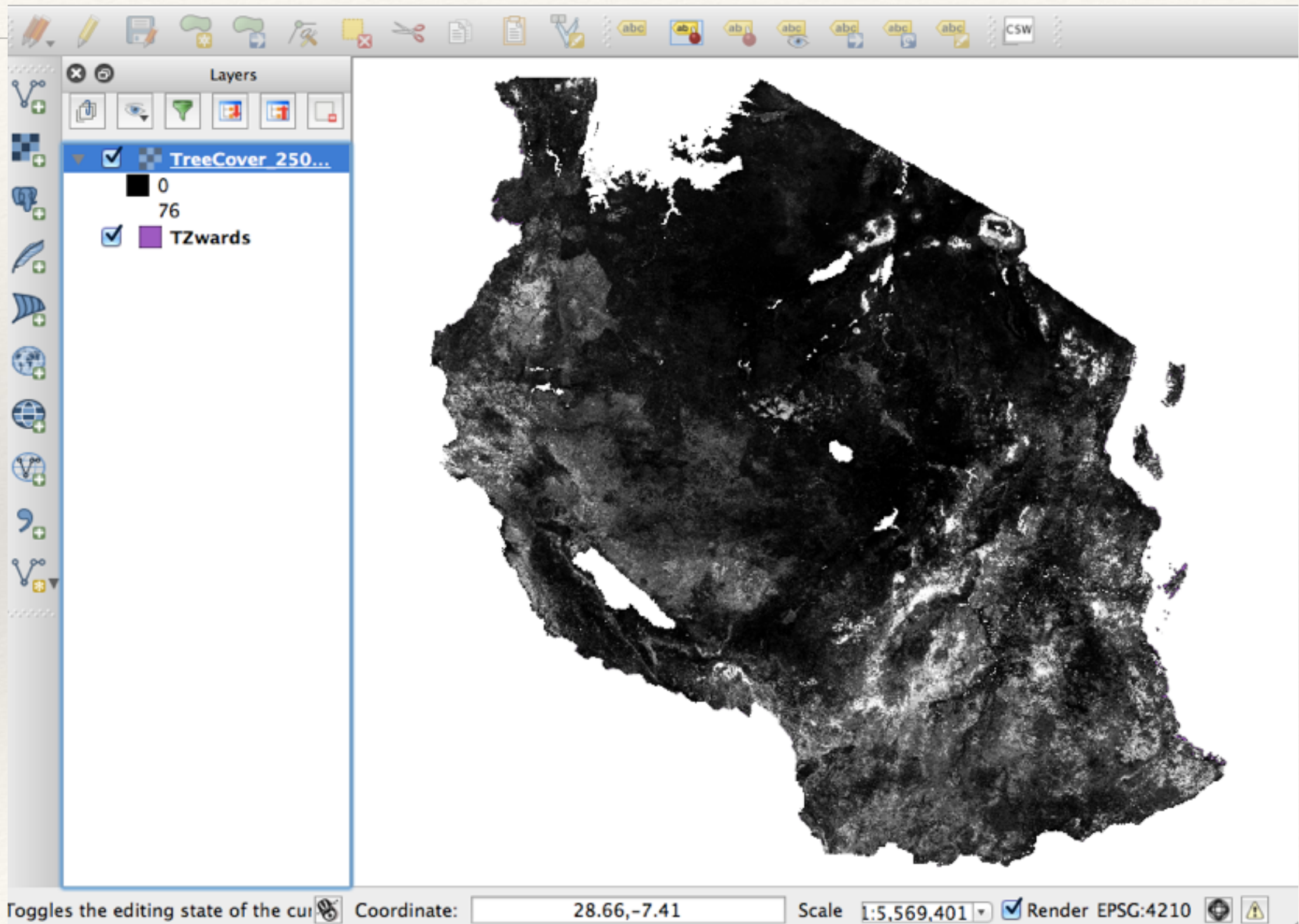
Looking at the dataset



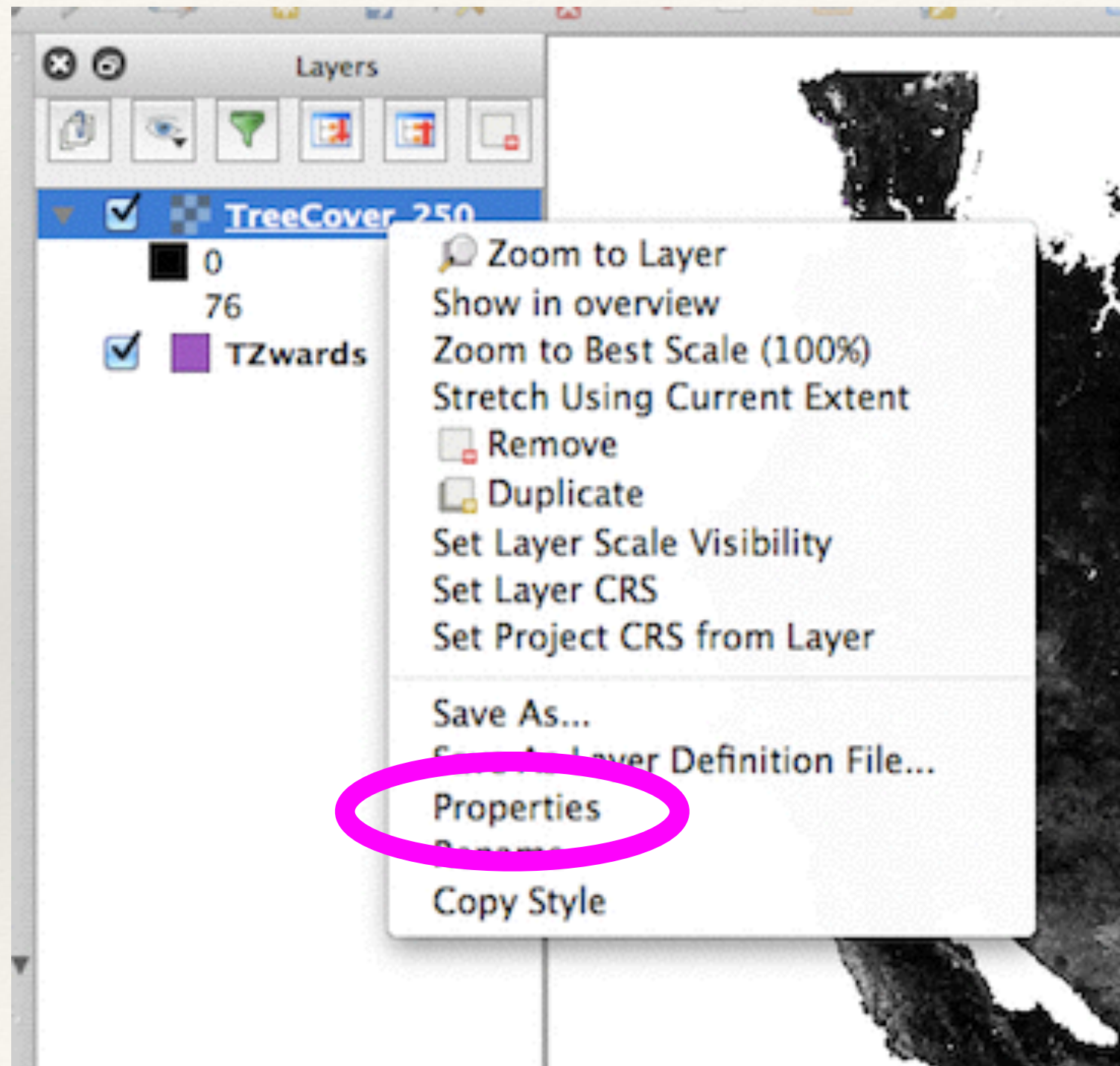
Attribute table

Attribute table – TZwards :: Features total: 3644, filtered: 3644, selected: 0									
	Region_Cod ▼	Region_Nam	District_C	District_N	Ward_Code	Ward_Name	Division	SHAPE_Leng	SHAPE_Area
0	01	Dodoma	01	Kondoa	011	Bumbuta	NULL	0.7693200...	0.0153833...
1	01	Dodoma	01	Kondoa	021	Pahi	NULL	0.4502161...	0.0088999...
2	01	Dodoma	01	Kondoa	041	Haubi	NULL	0.5386718...	0.0121750...
3	01	Dodoma	01	Kondoa	051	Kalamba	NULL	0.6789411...	0.0232249...
4	01	Dodoma	01	Kondoa	061	Kwadelo	NULL	0.7211141...	0.0253583...
5	01	Dodoma	01	Kondoa	071	Masange	NULL	0.3094704...	0.0041712...
6	01	Dodoma	01	Kondoa	081	Kikilo	NULL	0.4082400...	0.0073723...
7	01	Dodoma	01	Kondoa	091	Bereko	NULL	0.4333467...	0.0052928...
8	01	Dodoma	01	Kondoa	101	Kisese	NULL	0.5938593...	0.0167560...
9	01	Dodoma	01	Kondoa	111	Kikore	NULL	0.5134189...	0.0135750...
10	01	Dodoma	01	Kondoa	121	Serya	NULL	1.0020155...	0.0468718...
11	01	Dodoma	01	Kondoa	133	Kilimani	NULL	0.3510940...	0.0049635...
12	01	Dodoma	01	Kondoa	142	Chemchem	NULL	0.1826336...	0.0014007...
13	01	Dodoma	01	Kondoa	151	Hondo mairo	NULL	0.5487435...	0.0159501...
14	01	Dodoma	01	Kondoa	161	Bolisa	NULL	0.2211372...	0.0029493...
15	01	Dodoma	01	Kondoa	171	Kinyasi	NULL	0.4598523...	0.0101593...
16	01	Dodoma	01	Kondoa	181	Salanka	NULL	0.3529197...	0.0057029...
17	01	Dodoma	01	Kondoa	191	Itololo	NULL	0.3641031...	0.0074975...
18	01	Dodoma	01	Kondoa	201	Itaswi	NULL	1.1001062...	0.0642702...
19	01	Dodoma	01	Kondoa	211	Suruke	NULL	0.3742099...	0.0059948...
20	01	Dodoma	01	Kondoa	221	Kingale	NULL	0.9105635...	0.0431712...
21	01	Dodoma	01	Kondoa	232	Kondoa mjini	NULL	0.2383029...	0.0019770...
22	01	Dodoma	01	Kondoa	241	Kolo	NULL	0.4487421...	0.0083773...
23	01	Dodoma	01	Kondoa	251	Changaa	NULL	0.6762297...	0.0204203...

Raster Files



Getting more Information



Geotiff file information

General

Style

Transparency

Pyramids

Histogram

Metadata

▼ **Description**

Title

Abstract

Keyword list

Data Url

▼ **Attribution**

Title

Url

▼ **MetadataUrl**

Url

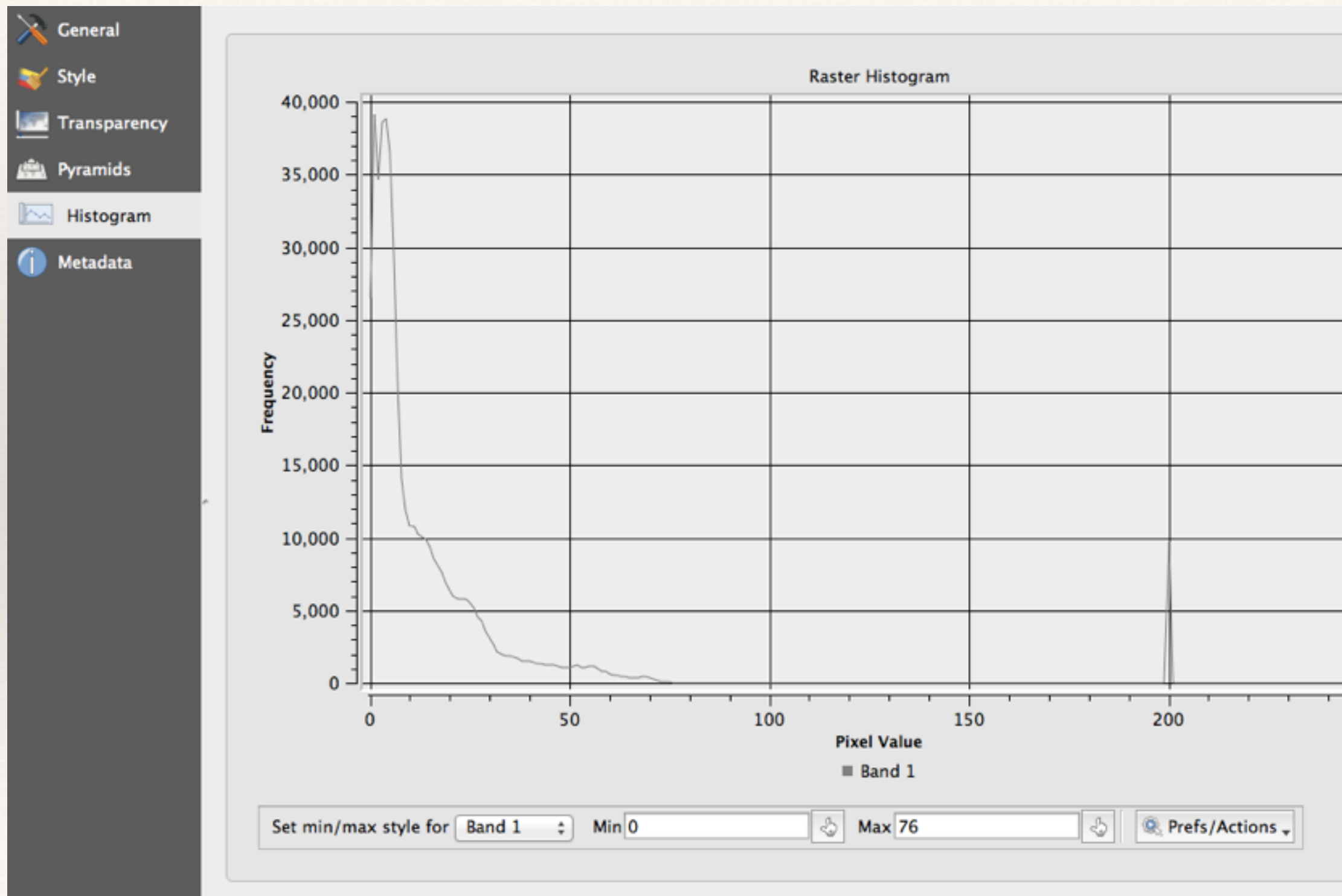
Type Format

▼ **LegendUrl**

Url

▼ **Properties**

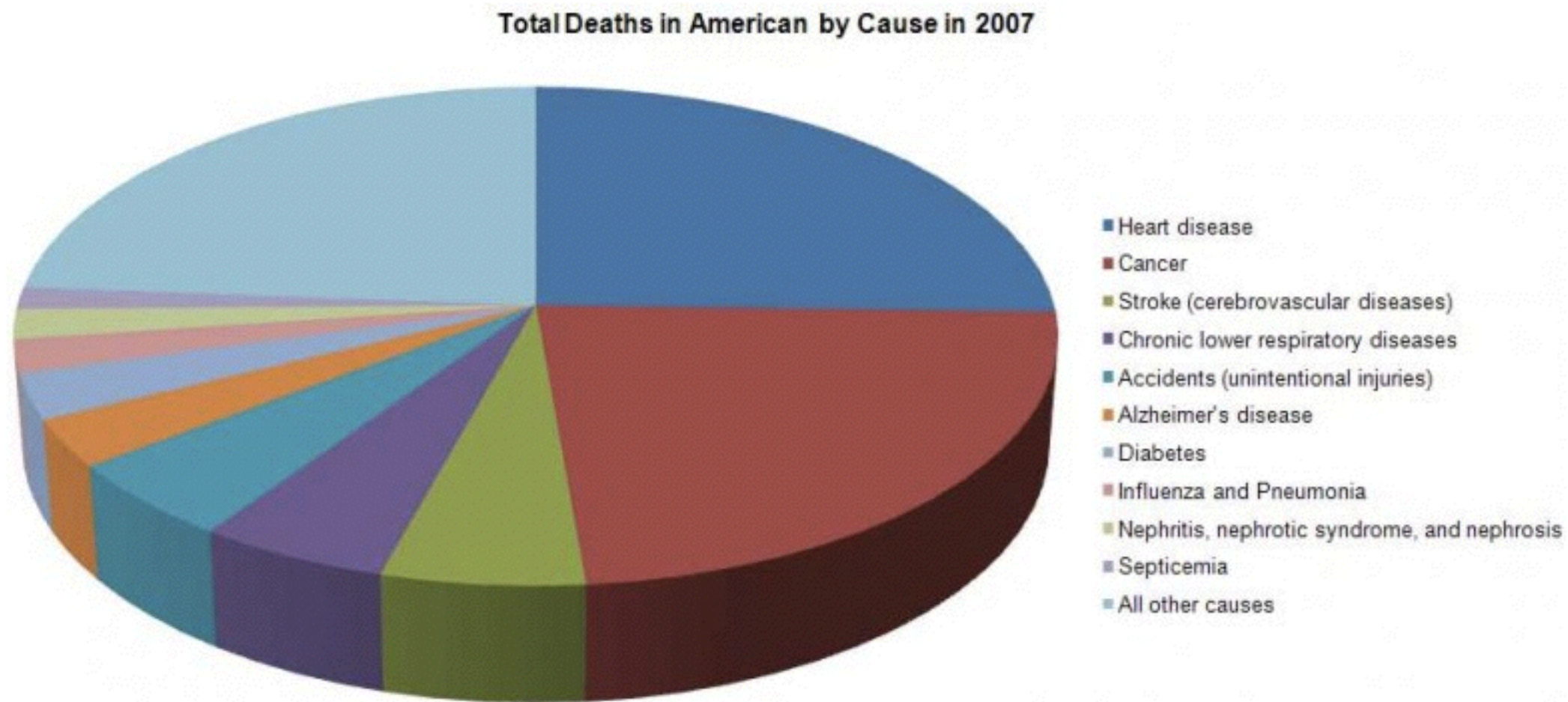
Histogram



Psychology checklist

- What's your important message (and what are you trying to hide?)
- Medium matters (laptop, phone, sms?)
- Colours matter
- As do angles and relative lengths.
- And think about your audience, e.g. what local effects do you need to be aware of, how do you compensate for colorblindness etc etc.
- New visualization type? Check the Gestalt principles

Please don't do this....



More about visualization

- Websites: Information is Beautiful, flowing data, ILoveCharts, Chart Porn, junk charts, [visual.ly](#) blog, [fivethirtyeight.com](#)
- Books:
 - Nathan Yao “Visualise this!”
 - anything by Tufte

Exercise!

- ❖ Use pencil and paper (or post-its) to design visualisations and dashboards for your project
- ❖ Start mocking-up those visualisations with the visualisation tool of your choice