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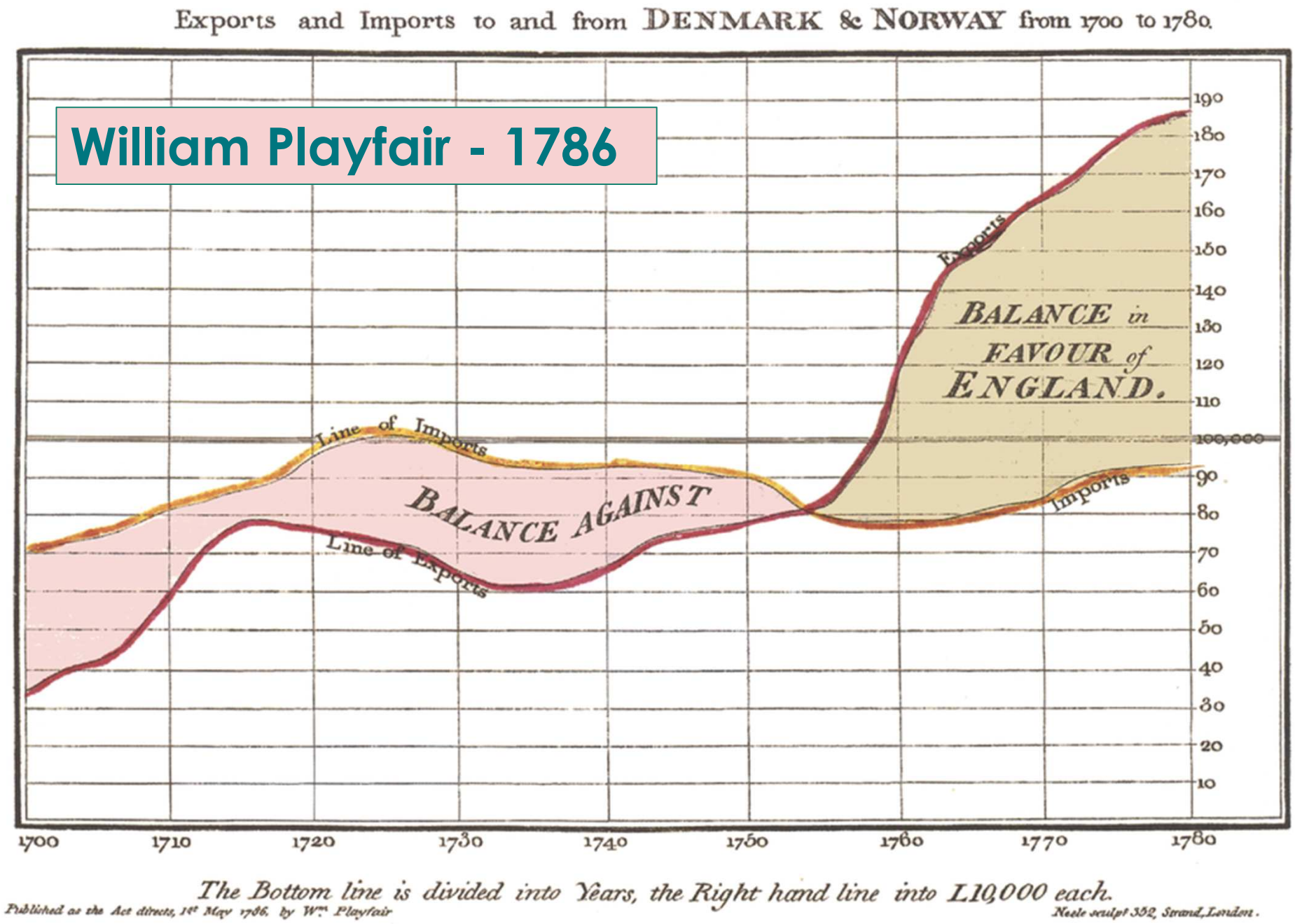
Excel 2016 Charts for Science

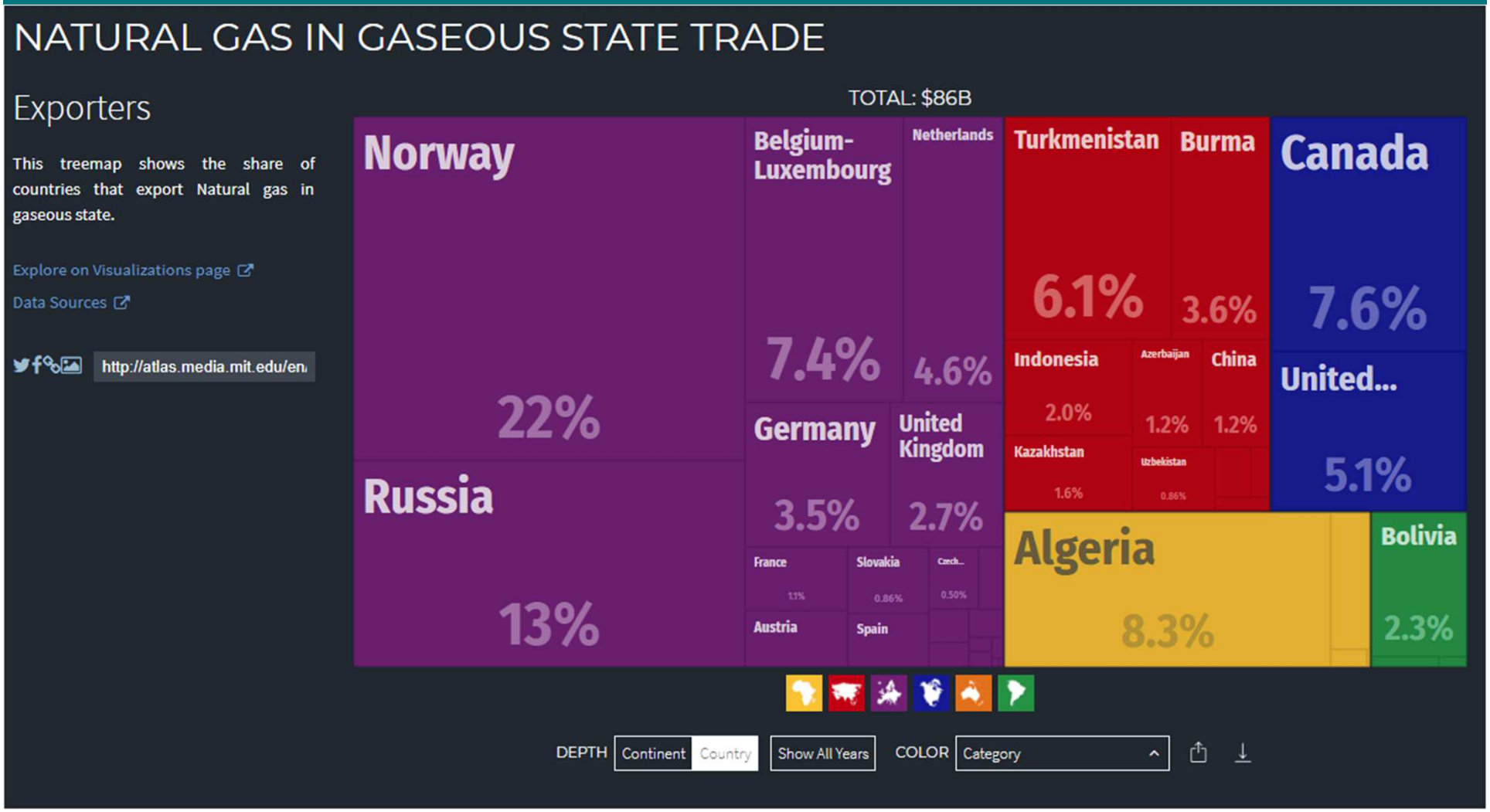
By Martha Nelson
Information Specialist

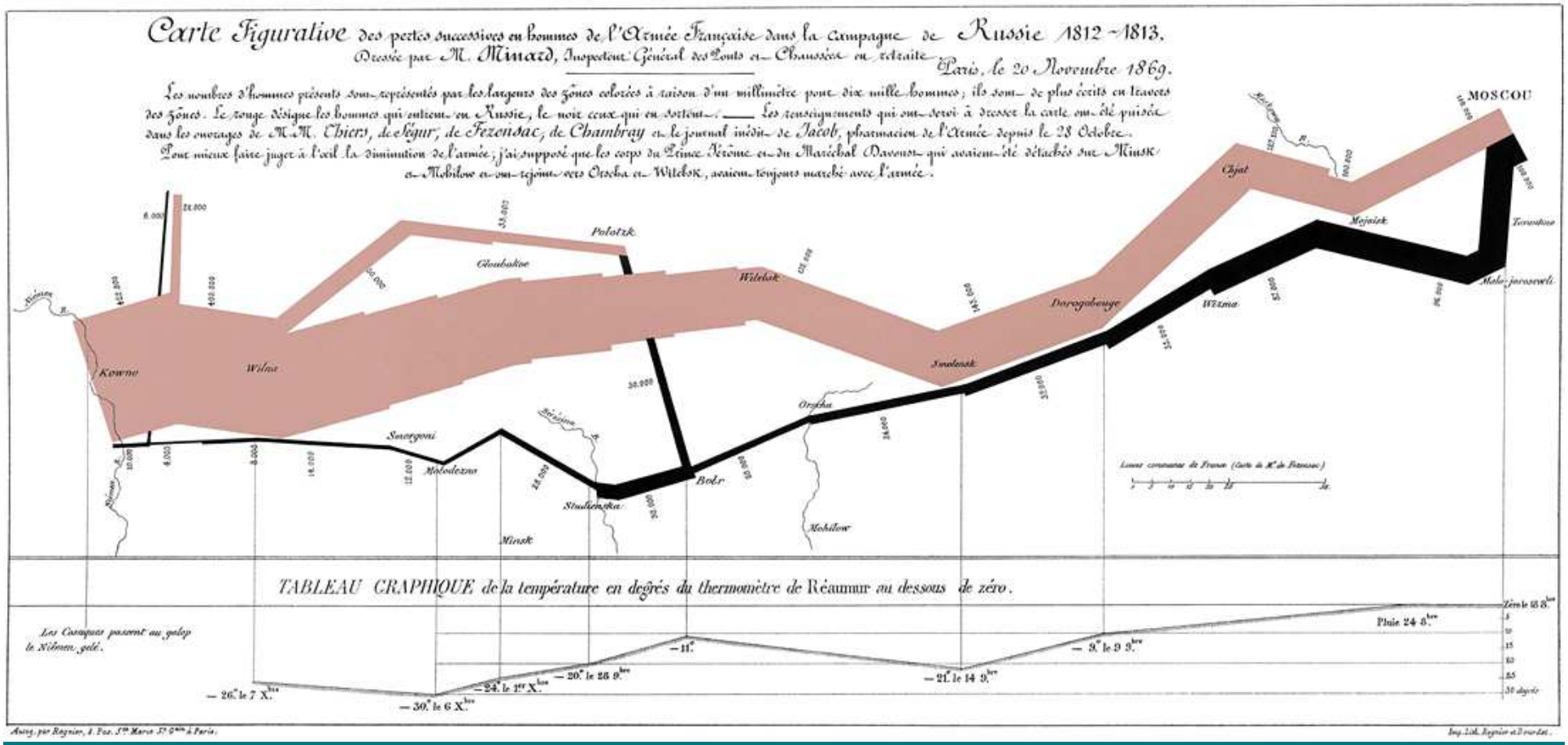
Charts communicate information visually


Exports and Imports to and from DENMARK & NORWAY from 1700 to 1780.
William Playfair - 1786
Exports
BALANCE in FAVOUR of ENGLAND.
Line of Imports
BALANCE AGAINST
Line of Exports
Imports
190
180
170
160
150
140
130
120
110
100,000
90
80
70
60
50
40
30
20
10
1700
1710
1720
1730
1740
1750
1760
1770
1780
The Bottom line is divided into Years, the Right hand line into £10,000 each.
Published as the Act directs, 1st May 1786. by Wm Playfair
Neale sculpt 352, Strand, London.

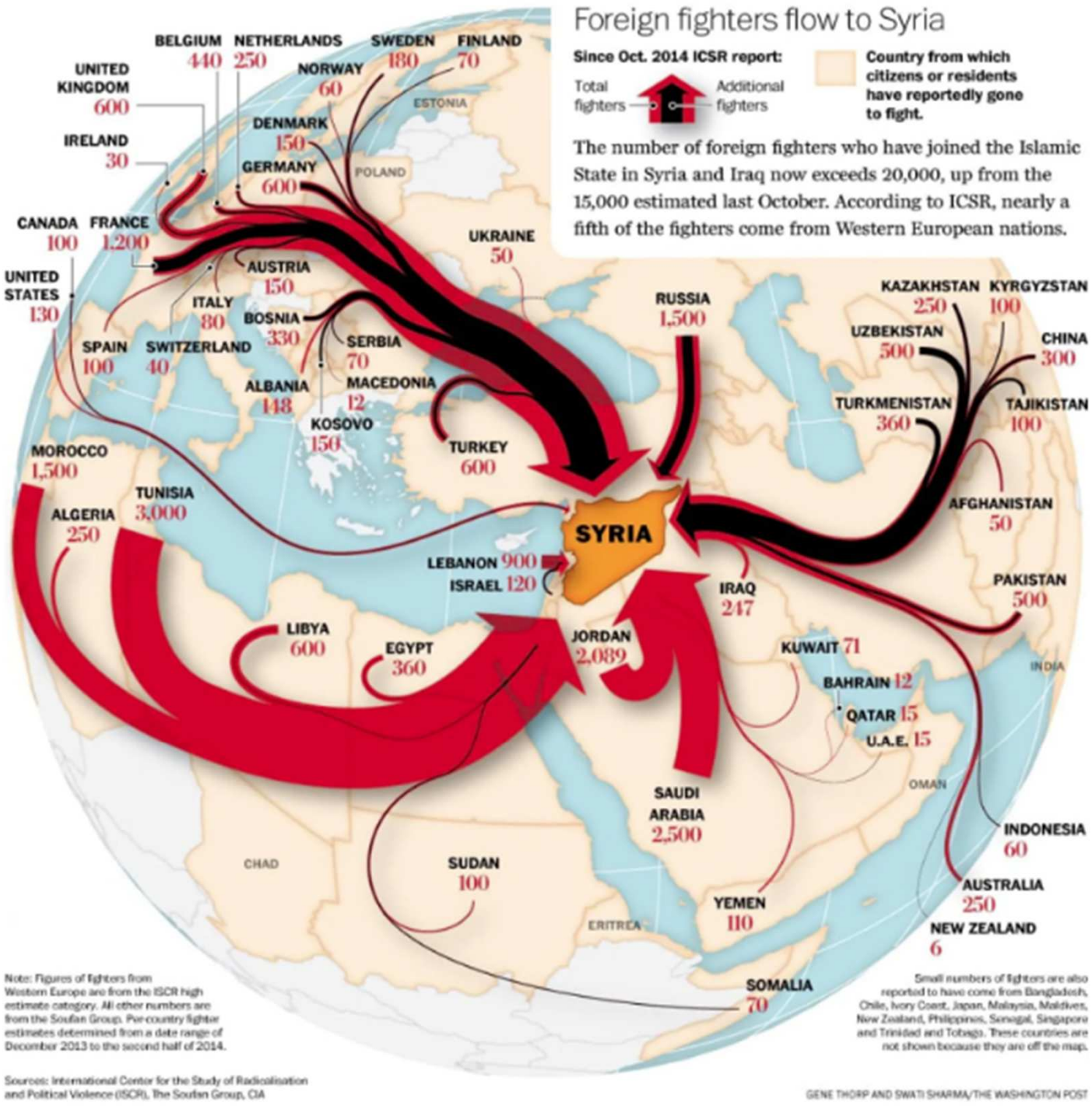
MIT's Observatory of Economic Complexity for world trade

https://atlas.media.mit.edu/en/



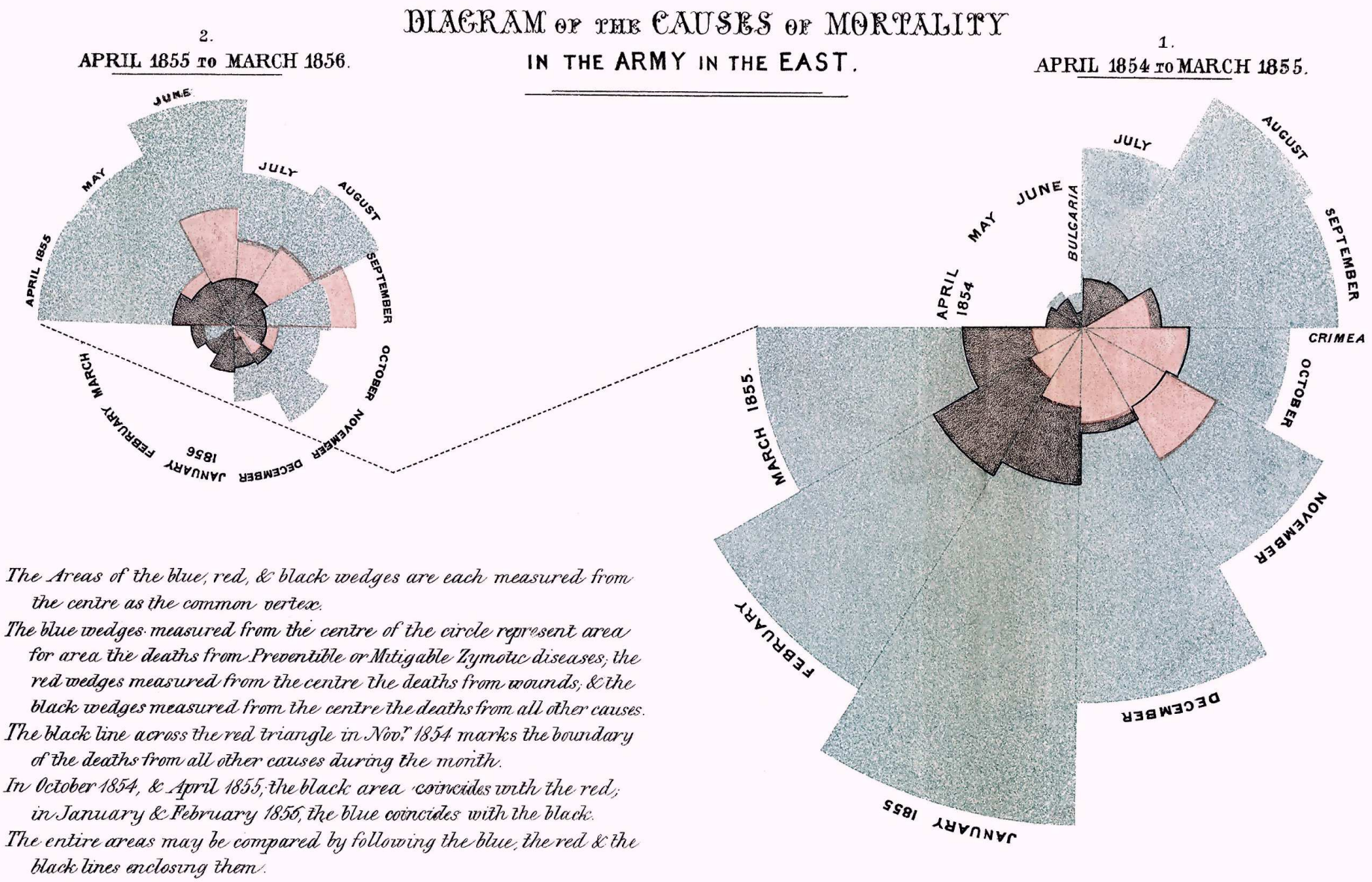


Charles Joseph Minard: Napoleon's Retreat From Moscow (The Russian Campaign 1812-1813)


Foreign fighters flow to Syria
Since Oct. 2014 ICSR report:
Total fighters
Additional fighters
Country from which citizens or residents have reportedly gone to fight.
The number of foreign fighters who have joined the Islamic State in Syria and Iraq now exceeds 20,000, up from the 15,000 estimated last October. According to ICSR, nearly a fifth of the fighters come from Western European nations.
BELGIUM 440
NETHERLANDS 250
SWEDEN 180
FINLAND 70
NORWAY 60
UNITED KINGDOM 600
IRELAND 30
DENMARK 150
GERMANY 600
ESTONIA
POLAND
CANADA 100
FRANCE 1,200
UKRAINE 50
UNITED STATES 130
AUSTRIA 150
ITALY 80
BOSNIA 330
SERBIA 70
SPAIN 100
SWITZERLAND 40
ALBANIA 148
MACEDONIA 12
KOSOVO 150
TURKEY 600
RUSSIA 1,500
KAZAKHSTAN 250
KYRGYZSTAN 100
UZBEKISTAN 500
CHINA 300
TURKMENISTAN 360
TAJIKISTAN 100
MOROCCO 1,500
TUNISIA 3,000
ALGERIA 250
SYRIA
AFGHANISTAN 50
LEBANON 900
ISRAEL 120
IRAQ 247
PAKISTAN 500
LIBYA 600
EGYPT 360
JORDAN 2,089
KUWAIT 71
INDIA
BAHRAIN 12
QATAR 15
U.A.E. 13
OMAN
SAUDI ARABIA 2,500
INDONESIA 60
CHAD
SUDAN 100
AUSTRALIA 250
YEMEN 110
ERITREA
NEW ZEALAND 6
SOMALIA 70
Note: Figures of fighters from Western Europe are from the ISCR high estimate category. All other numbers are from the Soufan Group. Per-country fighter estimates determined from a date range of December 2013 to the second half of 2014.
Small numbers of fighters are also reported to have come from Bangladesh, Chile, Ivory Coast, Japan, Malaysia, Maldives, New Zealand, Philippines, Senegal, Singapore and Trinidad and Tobago. These countries are not shown because they are off the map.
Sources: International Center for the Study of Radicalisation and Political Violence (ISCR), The Soufan Group, CIA
GENE THORP AND SWATI SHARMA/THE WASHINGTON POST

Flow Map

Florence Nightingale's Coxcomb chart - 1858



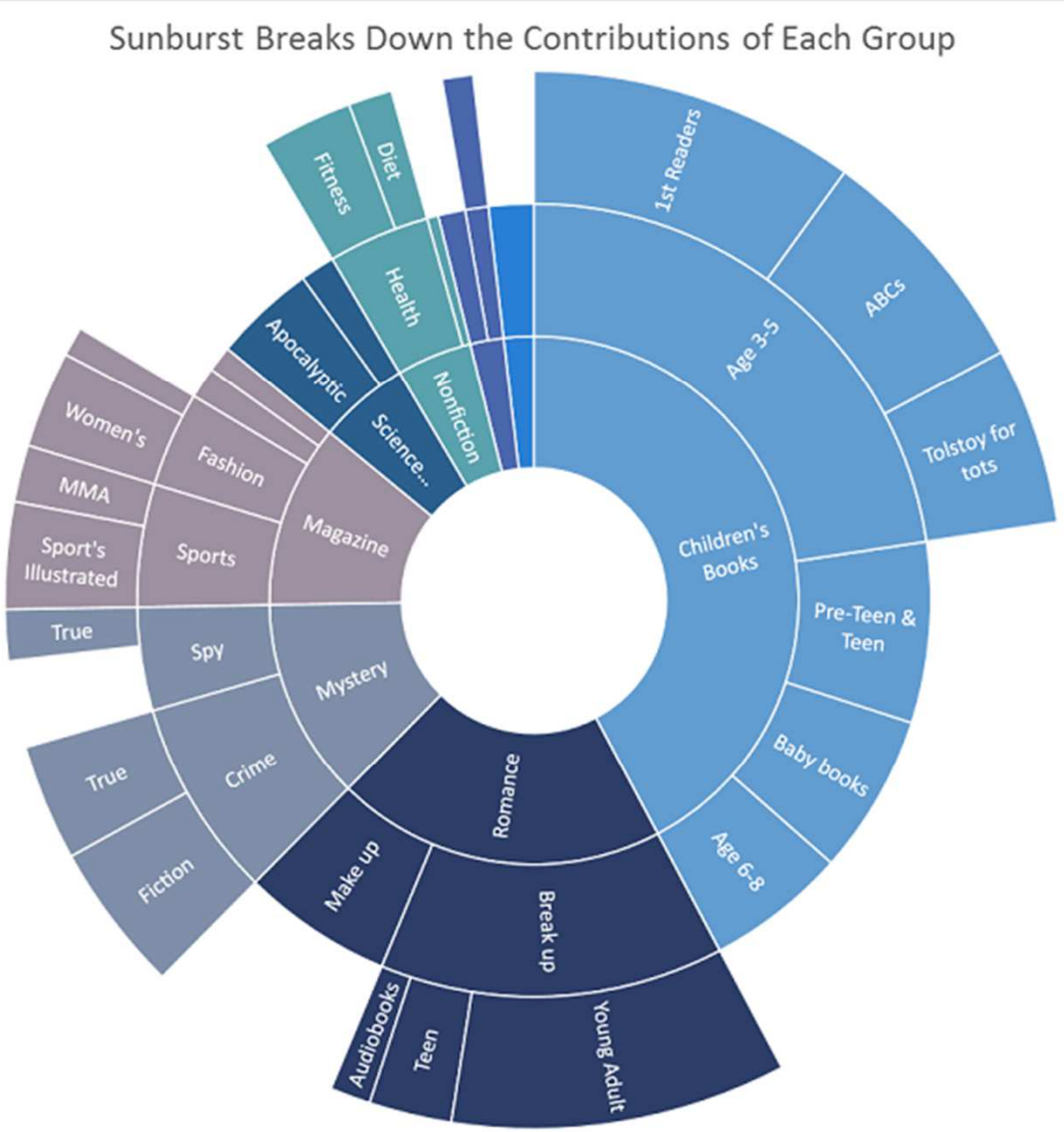
The Areas of the blue, red, & black wedges are each measured from the centre as the common vertex.

The blue wedges measured from the centre of the circle represent area for area the deaths from Preventible or Mitigable Zymotic diseases, the red wedges measured from the centre the deaths from wounds, & the black wedges measured from the centre the deaths from all other causes.

The black line across the red triangle in Nov.r 1854 marks the boundary of the deaths from all other causes during the month.

In October 1854, & April 1855, the black area coincides with the red; in January & February 1856, the blue coincides with the black.

The entire areas may be compared by following the blue, the red & the black lines enclosing them.



Sunburst Chart made with Excel

Sold for the benefit of the

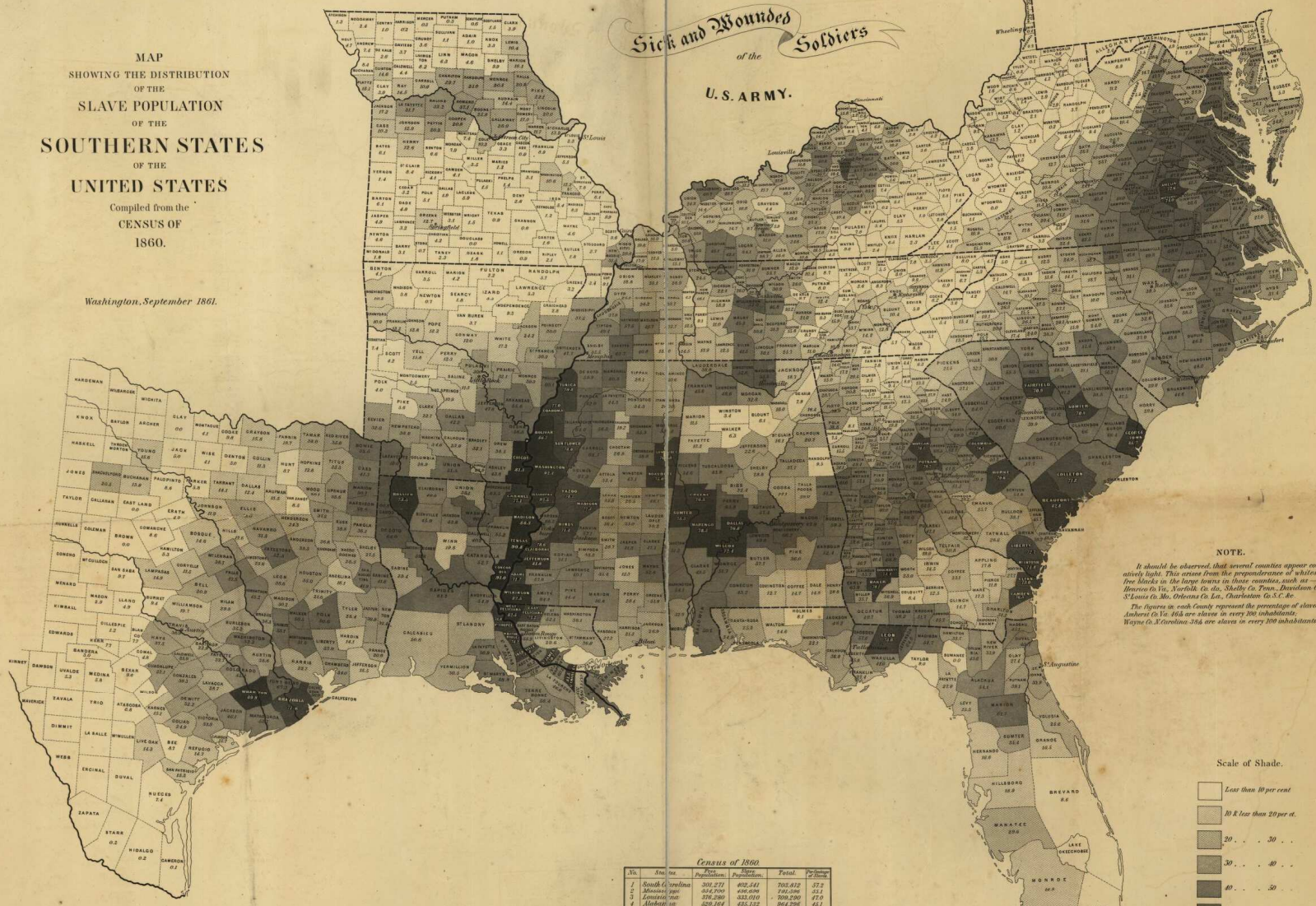
Sick and Wounded Soldiers

of the

U. S. ARMY.

MAP
SHOWING THE DISTRIBUTION
OF THE
SLAVE POPULATION
OF THE
SOUTHERN STATES
OF THE
UNITED STATES
Compiled from the
CENSUS OF
1860.

Washington, September 1861.



NOTE.

It should be observed, that several counties appear comparatively light. This arises from the preponderance of whites and free blacks in the large towns in those counties, such as ——— Henrico Co. Va., Norfolk Co. do., Shelby Co. Tenn., Davidson Co. do., St Louis Co. Mo. Orleans Co. La., Charleston Co. S.C. &c.

The figures in each County represent the percentage of slaves viz: Amherst Co. Va. 46% are slaves in every 100 inhabitants; Wayne Co. N. Carolina 38% are slaves in every 100 inhabitants &c.&c.

Census Office, Department of the Interior.
Washington, Sept. 9th 1861.

After a careful examination of the above very interesting map I am prepared to state that it not only furnishes the evidences of great care in its execution, but can be relied on as corresponding with the official returns of the 8th Census.

Jno. G. Kennedy
Superintendent

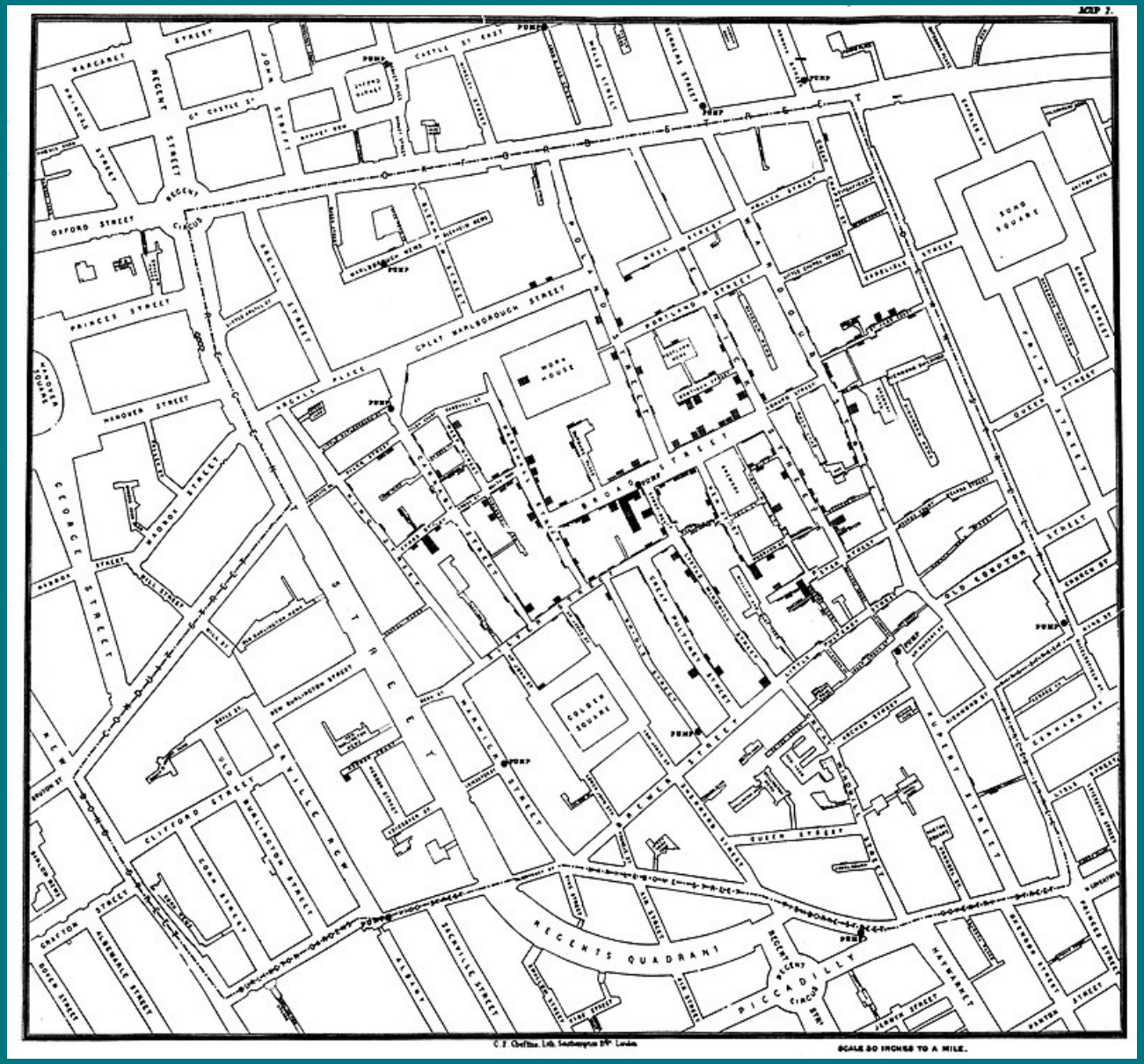
Census of 1860.

No.	State.	Free Population.	Slave Population.	Total.	Per Centage of Slaves.
1	South Carolina	301,271	402,541	703,812	57.2
2	Mississippi	354,700	436,696	791,396	55.1
3	Louisiana	376,280	333,010	709,290	47.0
4	Alabama	520,164	435,132	964,296	45.1
5	Florida	78,686	61,753	140,439	43.9
6	Georgia	595,097	462,232	1057,329	43.7
7	North Carolina	661,586	331,081	992,667	33.4
8	Virginia	1,105,102	490,887	1,596,079	30.7
9	Texas	421,750	180,682	602,432	30.0
10	Arkansas	324,323	111,104	435,427	25.5
11	Tennessee	834,063	275,784	1,109,841	24.8
12	Kentucky	930,223	225,490	1,155,713	19.5
13	Maryland	599,846	87,188	687,034	12.7
14	Missouri	1067,352	114,965	1182,317	9.7
15	Delaware	110,420	1,798	112,218	1.6
		8,289,953	3,950,343	12,240,296	32.3

Engr by Th. Leonhardt.

Drawn by E. Hergesheimer.

551A

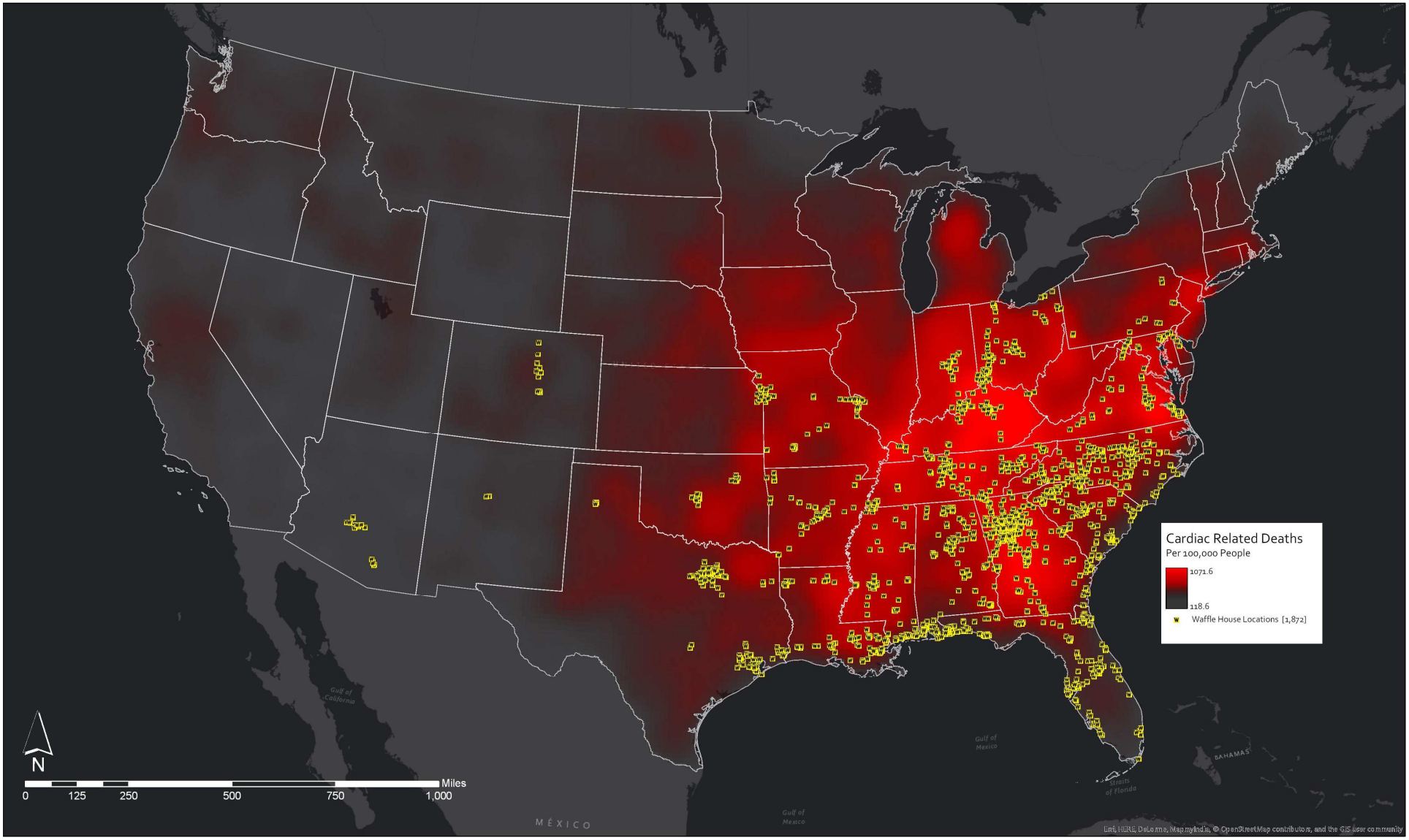


Dr. John Snow's Cholera map 1854

Data: CDC and Waffle House

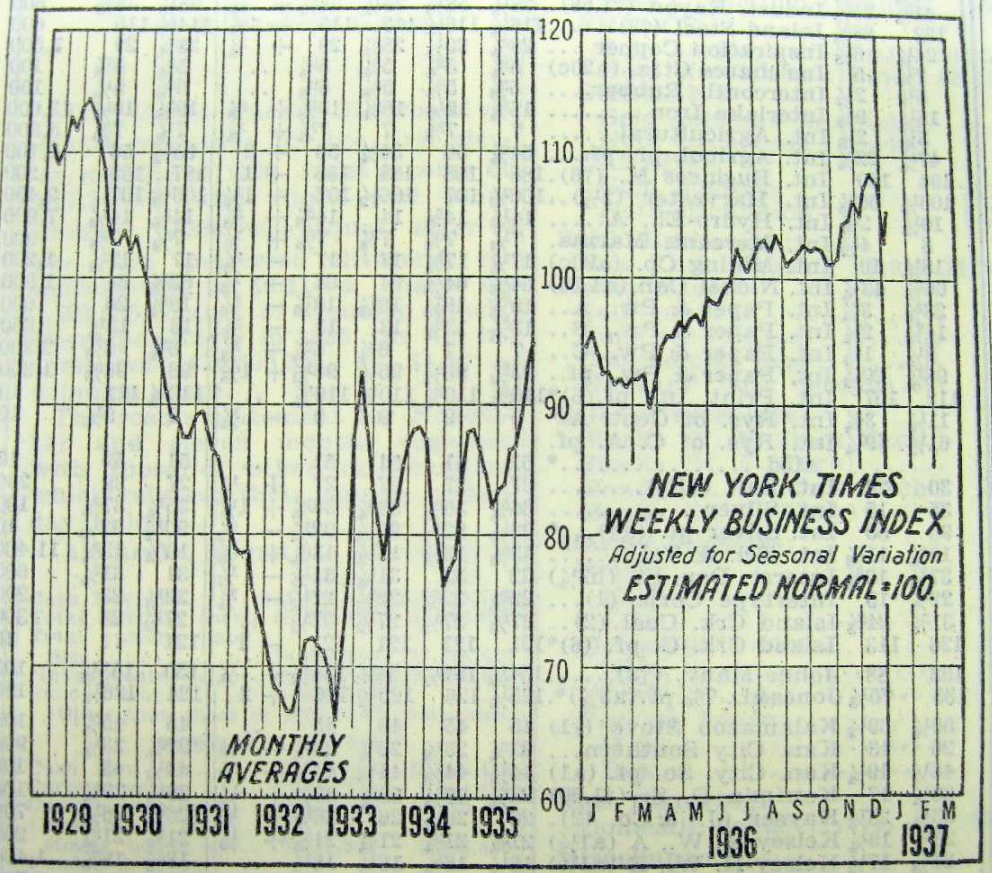
Tools: ArcGIS Pro

Cardiac Related Deaths During 2013 in the Contiguous USA Compared to Waffle House Locations



BUSINESS INDEX RISES

Regains Part of Its Last Loss as Five Components Register Increases for the Week.

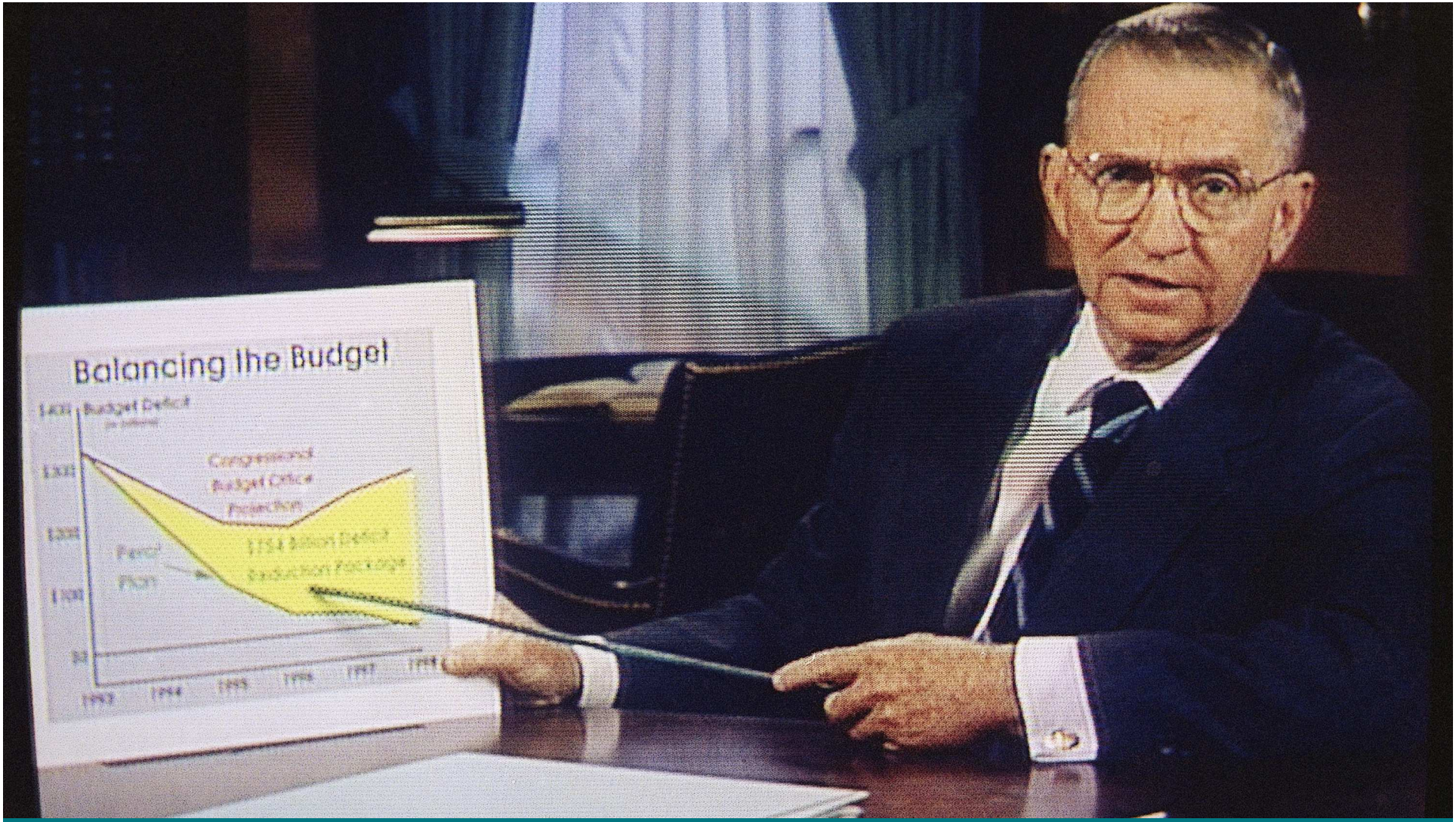


With five of its components higher, THE NEW YORK TIMES weekly index of business activity has regained part of its last loss by moving to 105.5 for the week ended Jan. 9 from 103.0 in the previous week. The index stood at 95.6 for the corresponding week last year.

In weighted influence the best gain was contributed by the electric series advanced, motor output expanding more than seasonally. Losses were recorded by the lumber and cotton mill activity series.

The following table gives the combined index and its components, each of which has been adjusted for seasonal variation and, in the case of carloadings, electric power production and cotton mill activity.

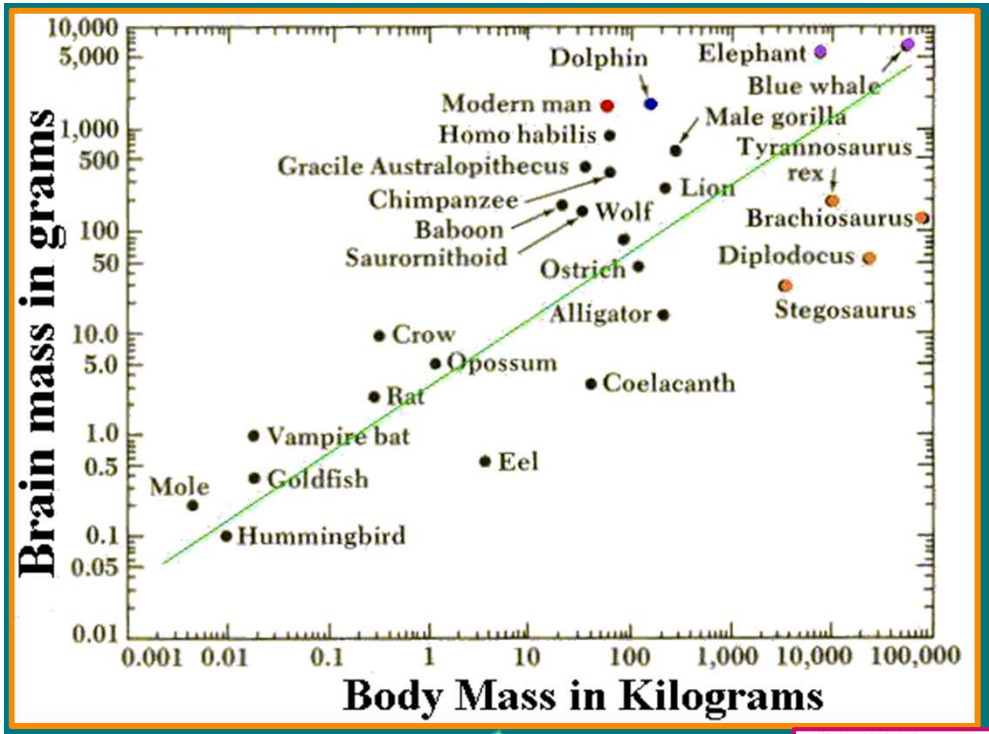
An historic line graph

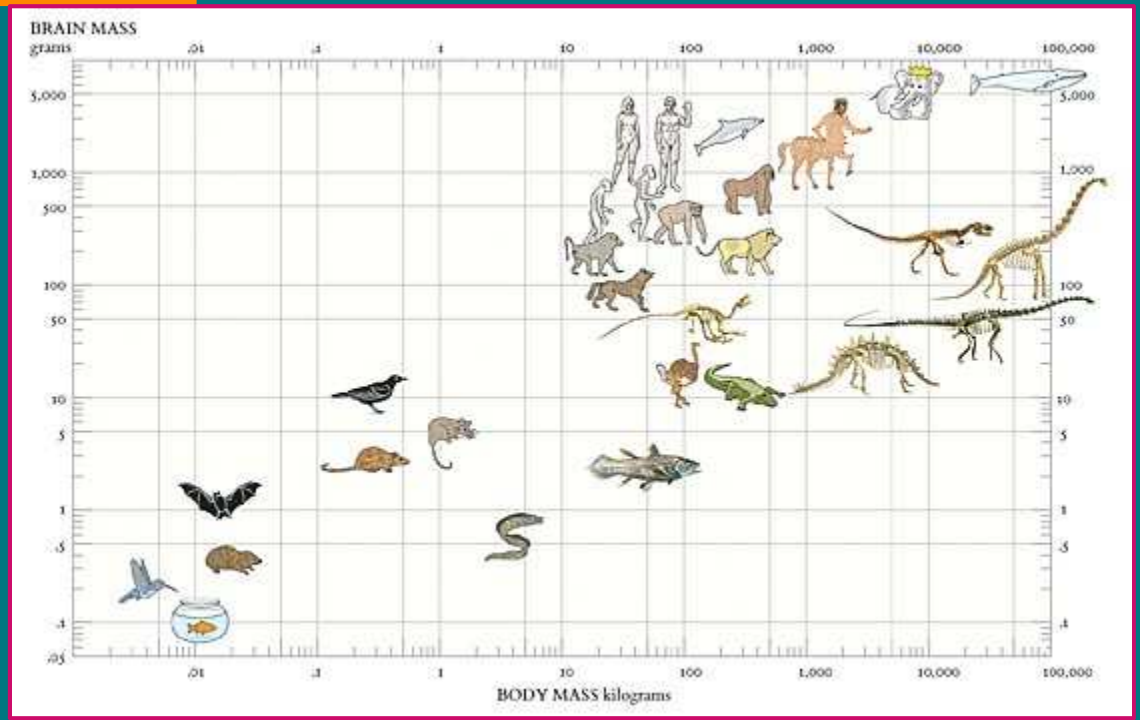


H Ross Perot -1992

Edward Tufte

Original chart by Carl Sagan





Things I think about before creating a chart

1. Who is your audience?

2. How it will be used Print or online?

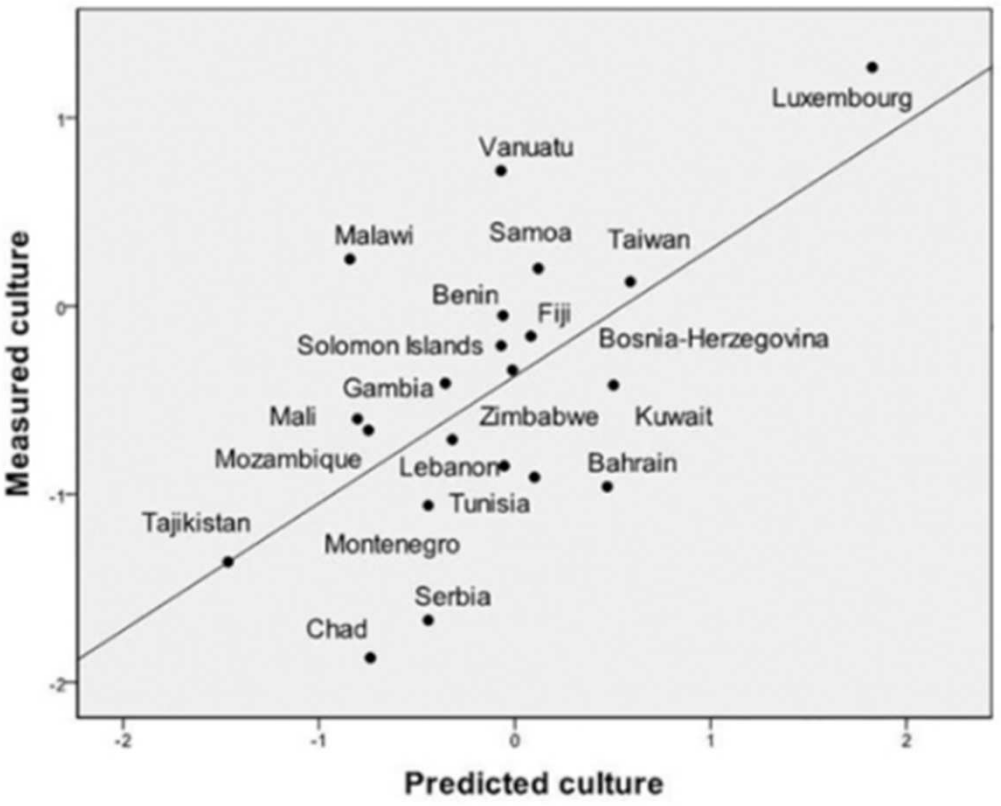
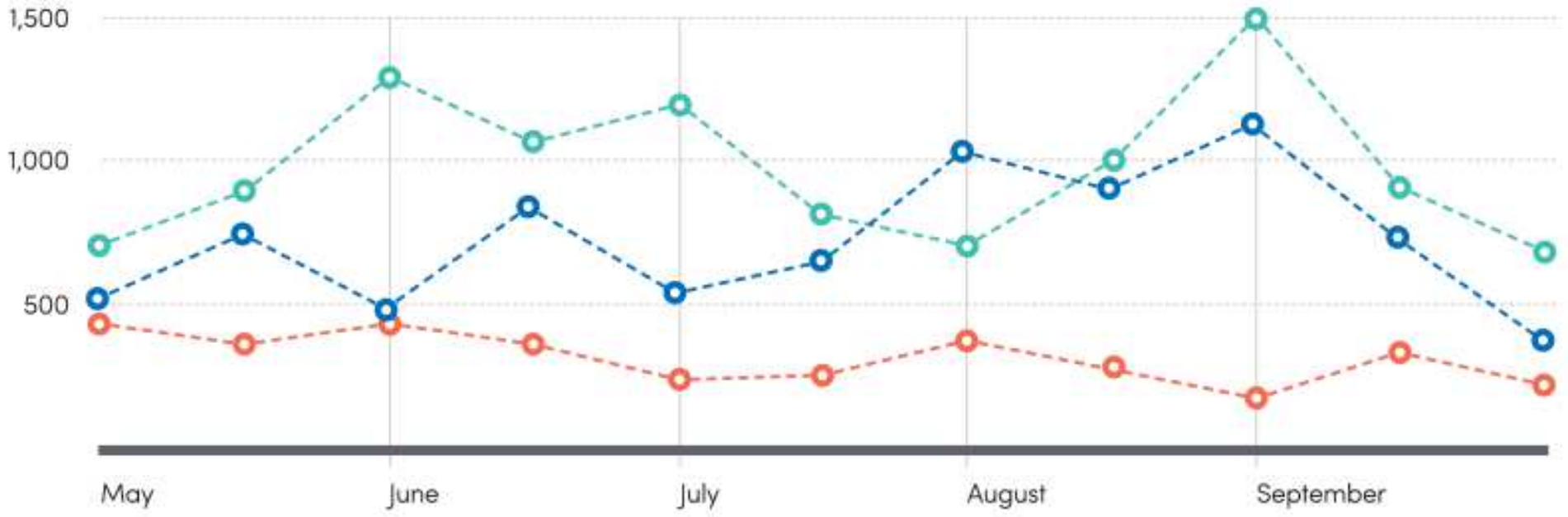


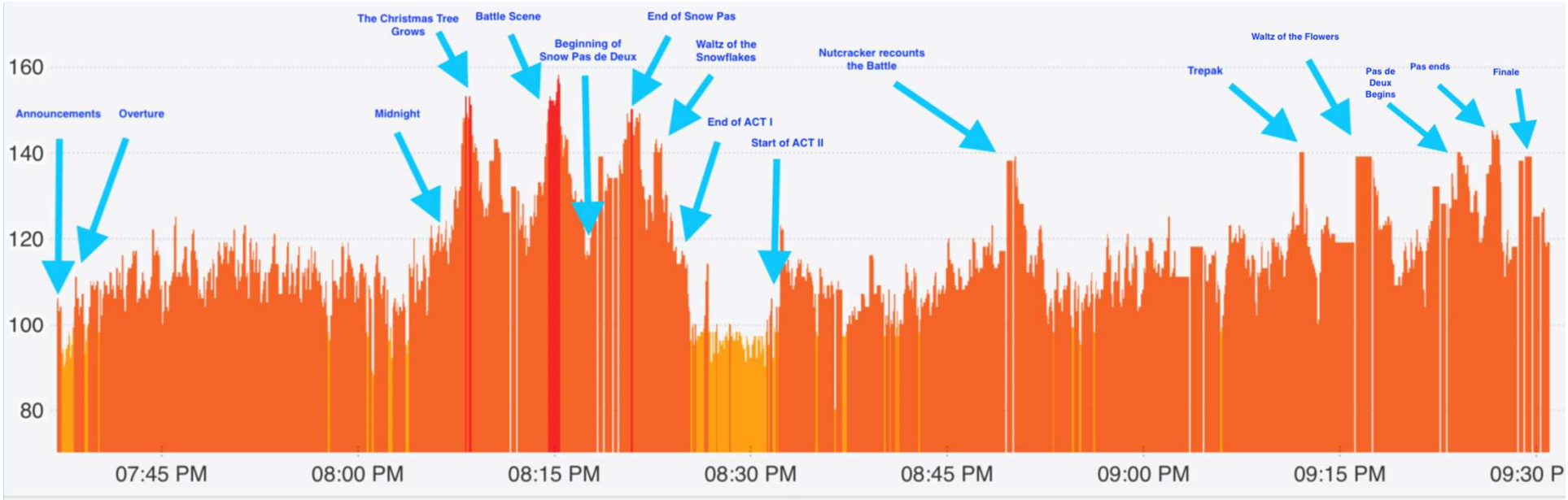
Figure 3 ■ Privileged culture predicted by the interaction of climatic demands and wealth resources corresponds with privileged culture measured in 21 non-sample countries.

JSTOR retrieved article

Where will you get your data?

- Personal data you have collected
- From an employer
- Government websites
- Wikipedia, ESPN, Dow Jones





AVERAGE BPM

115bpm

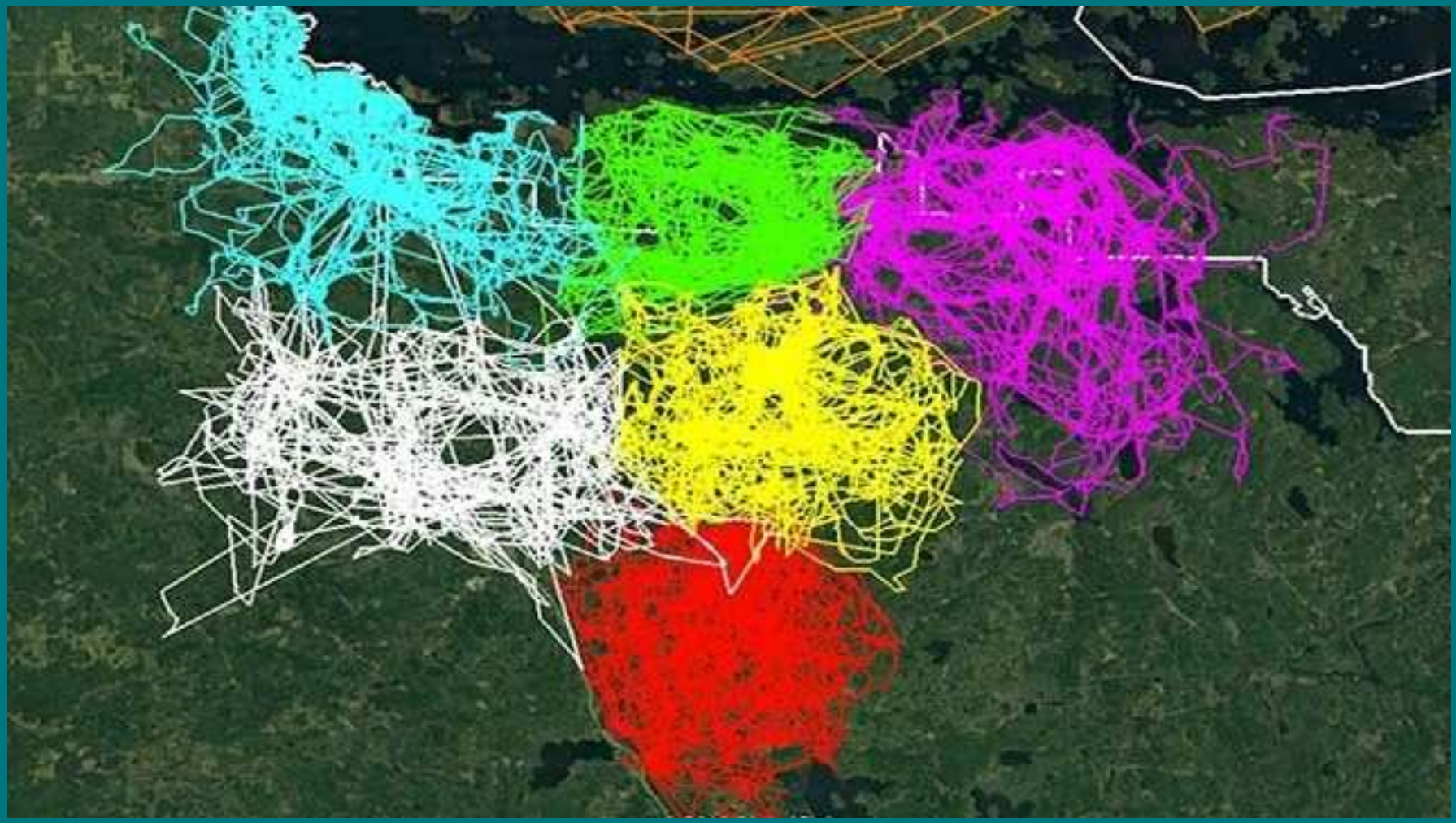
PEAK BPM

158bpm

A conductor wore a heart monitor during The Nutcracker. He annotated his Health app report

- *AeroMaestro*

Minnesota's Voyageurs Wolf Project data maps

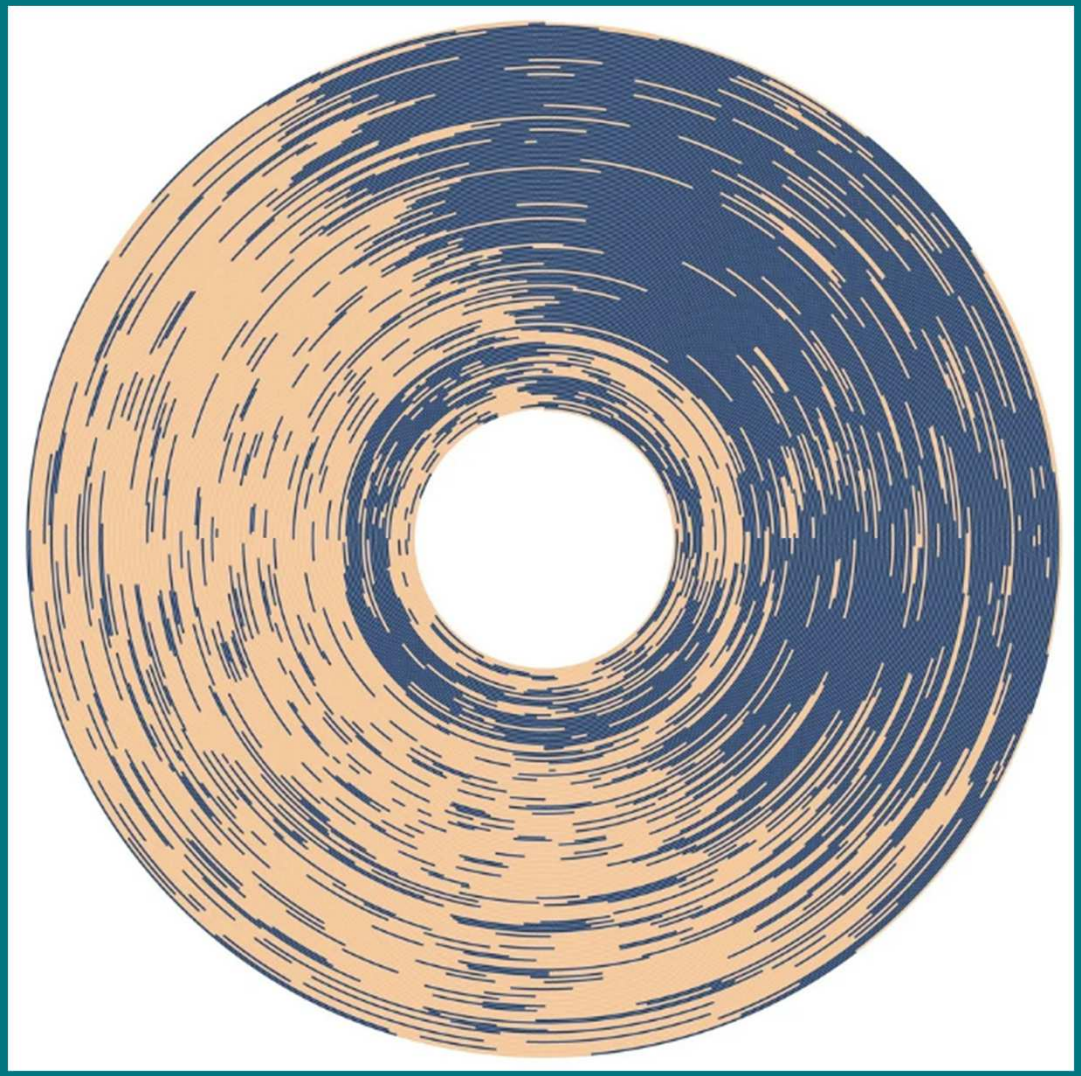


Sleep patterns of the first six months of an infant's life.

Tracked using: Baby Connect iPhone app.

CAD package Rhinoceros with Grasshopper plugin

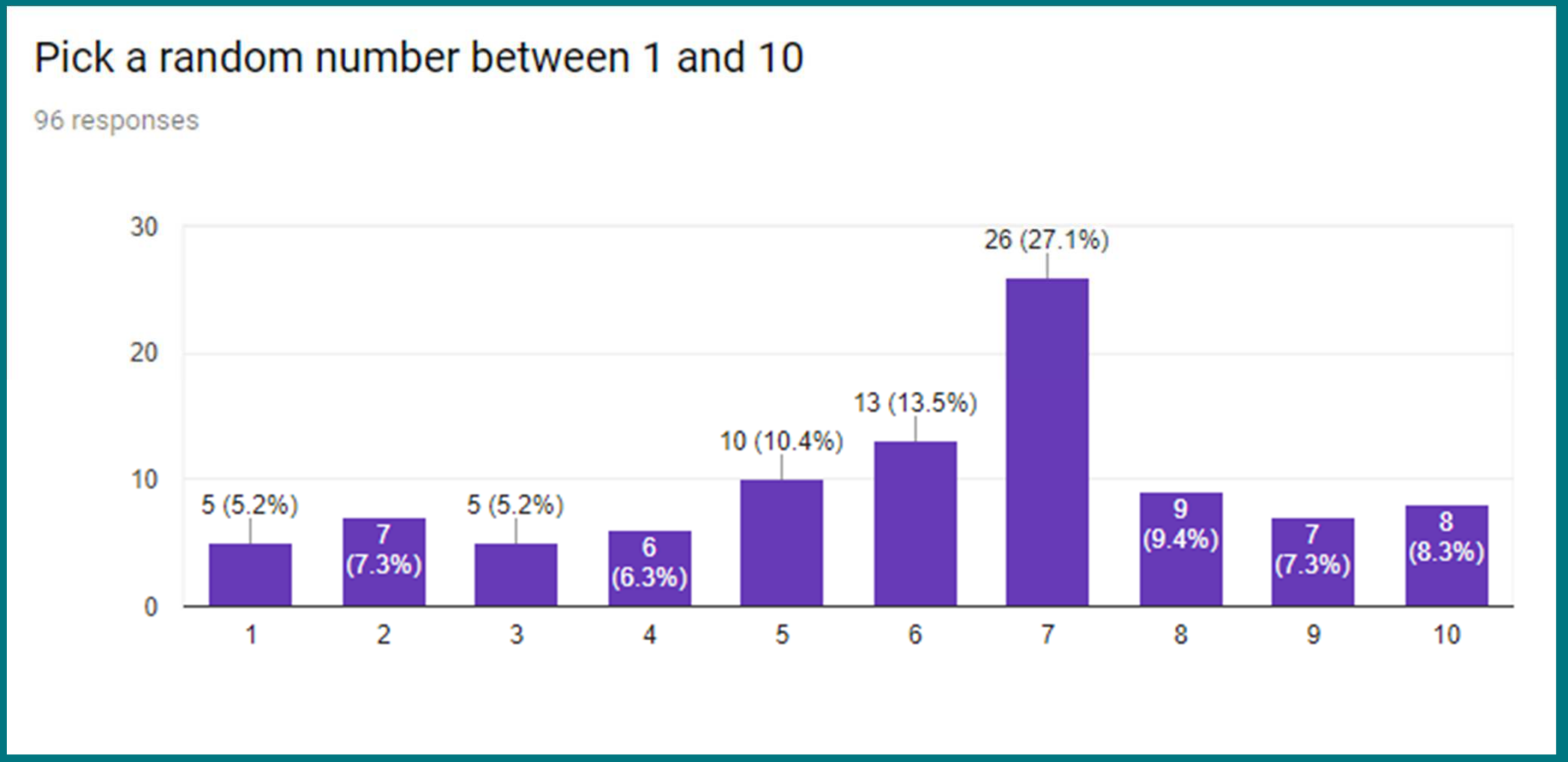
Adobe Illustrator for colors

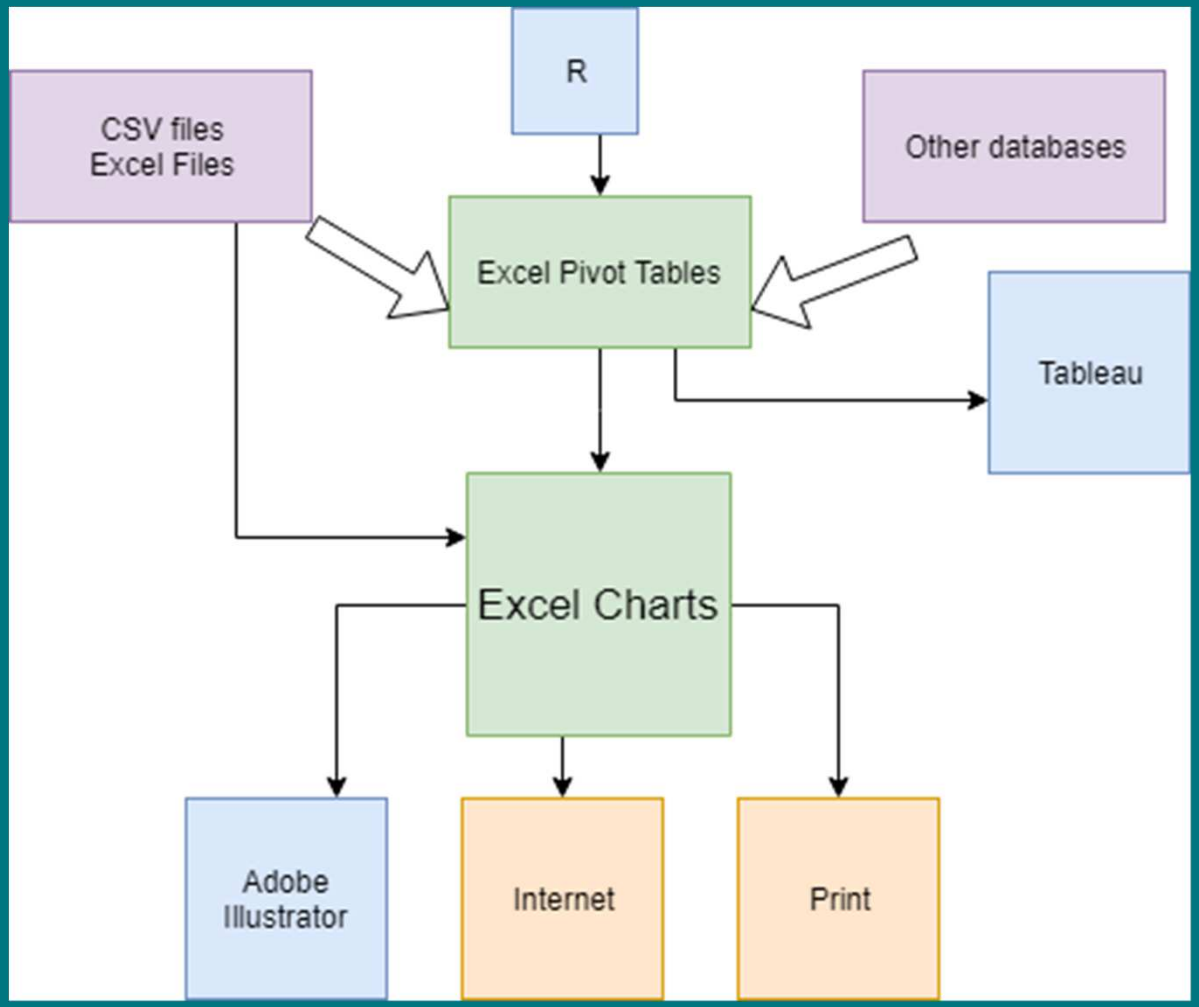


What software will you use?

- R – statistics program
- Excel – Microsoft Office spreadsheet
- Python – web dev language
- Chart generators on the web
- Google Sheets & charts

Google forms
Google Charts (all free!)





Many possible ways and processes to create a wonderful chart for science

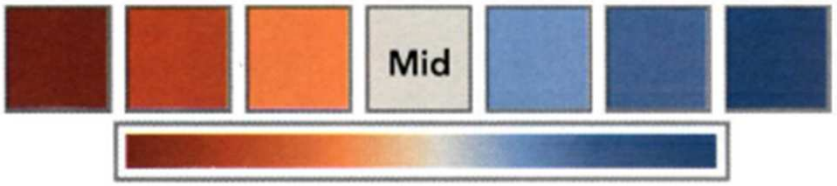
Beyond Excel:

- Microsoft Power BI
- Tableau
- QlikView
- Illustrator and other image / photo programs

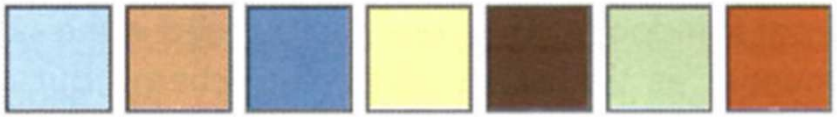
Use of Color in Data Visualization

Sequential
color is ordered from low to high

Diverging
two sequential colors with a neutral midpoint



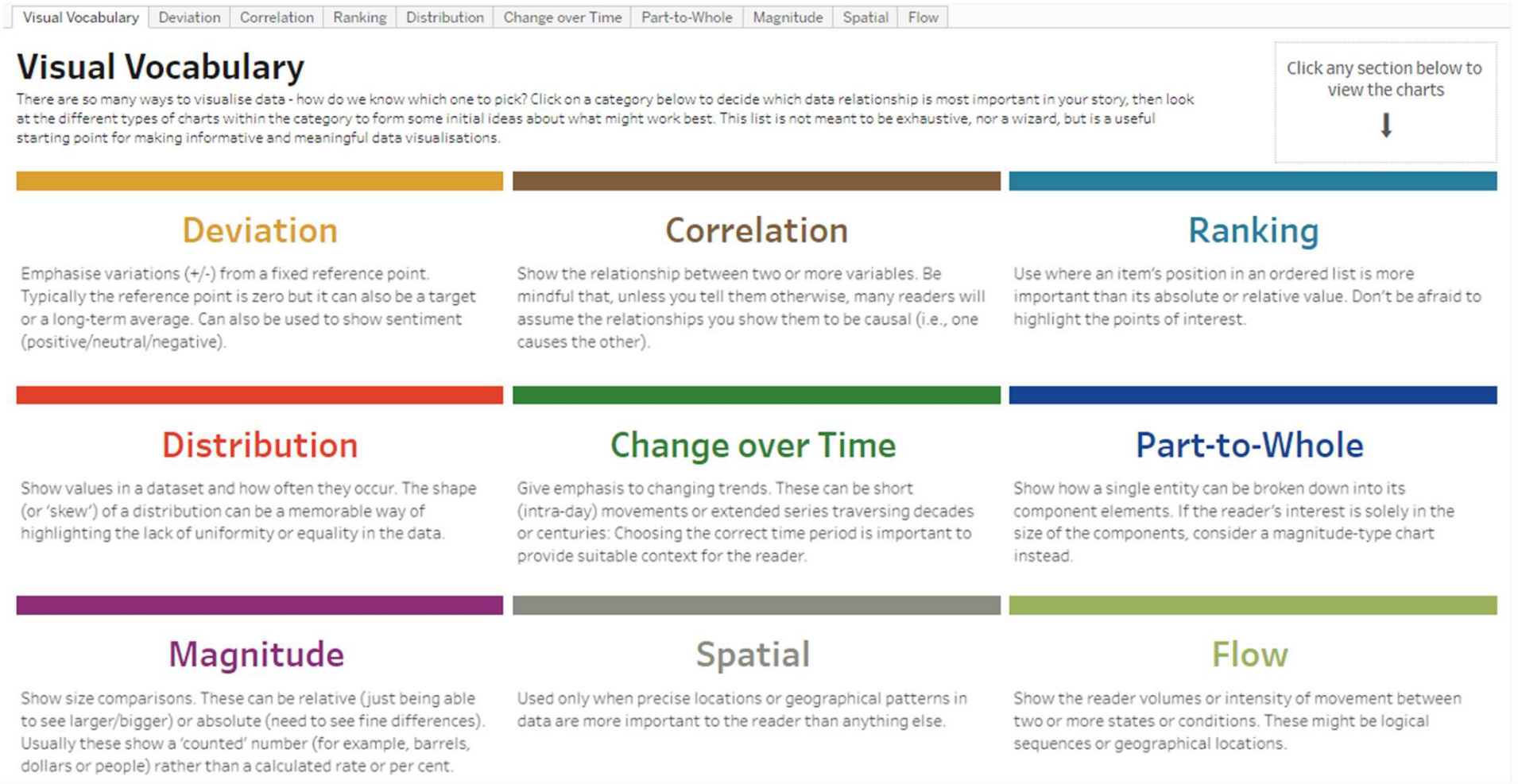
Categorical
contrasting colors for individual comparison



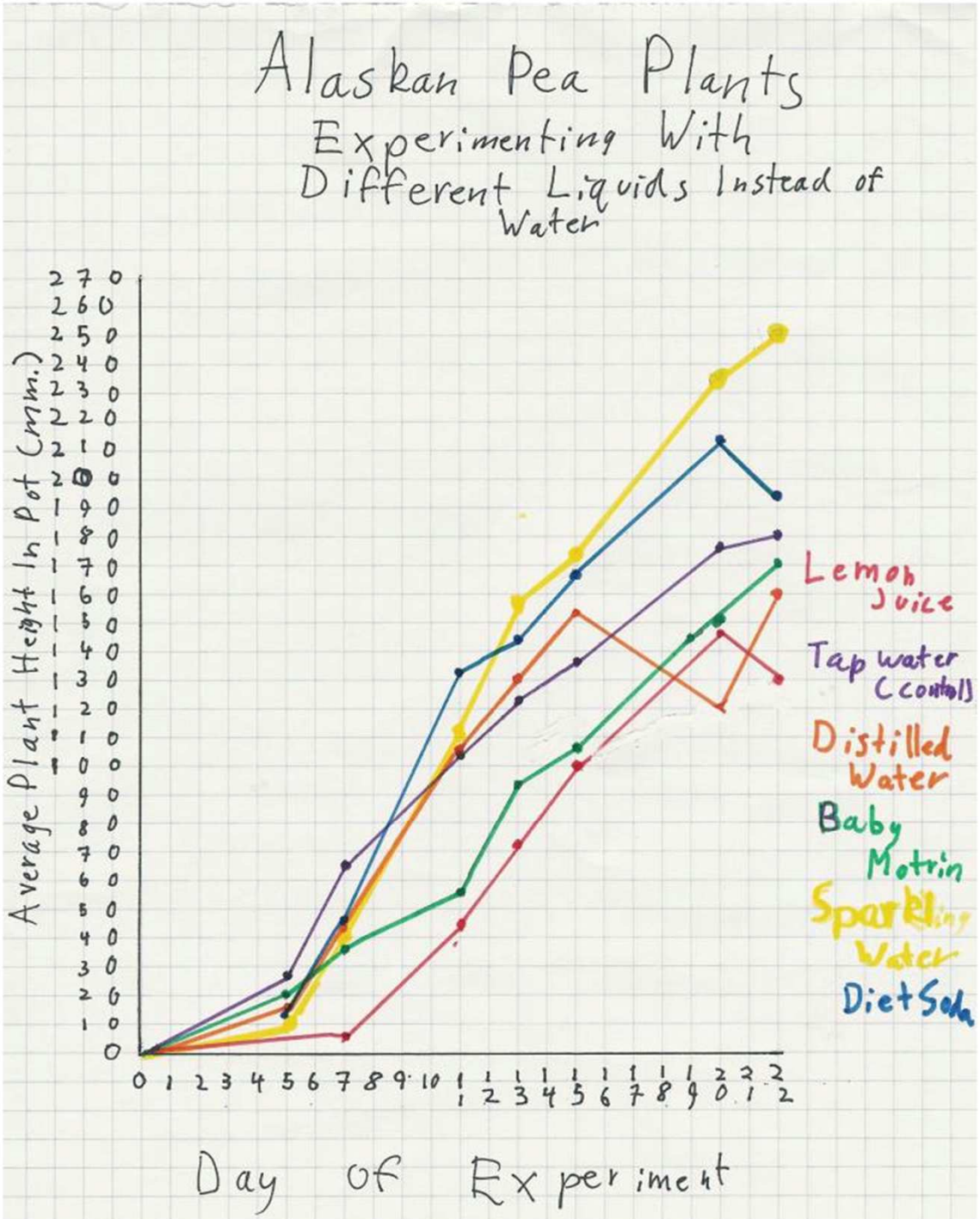
Highlight
color used to highlight something

Alert
color used to alert or warn reader

FIGURE 1.16 Use of color in data visualization.



https://public.tableau.com/profile/andy.kriebel#!/vizhome/VisualVocabulary/VisualVocabulary



Charts communicate information visually

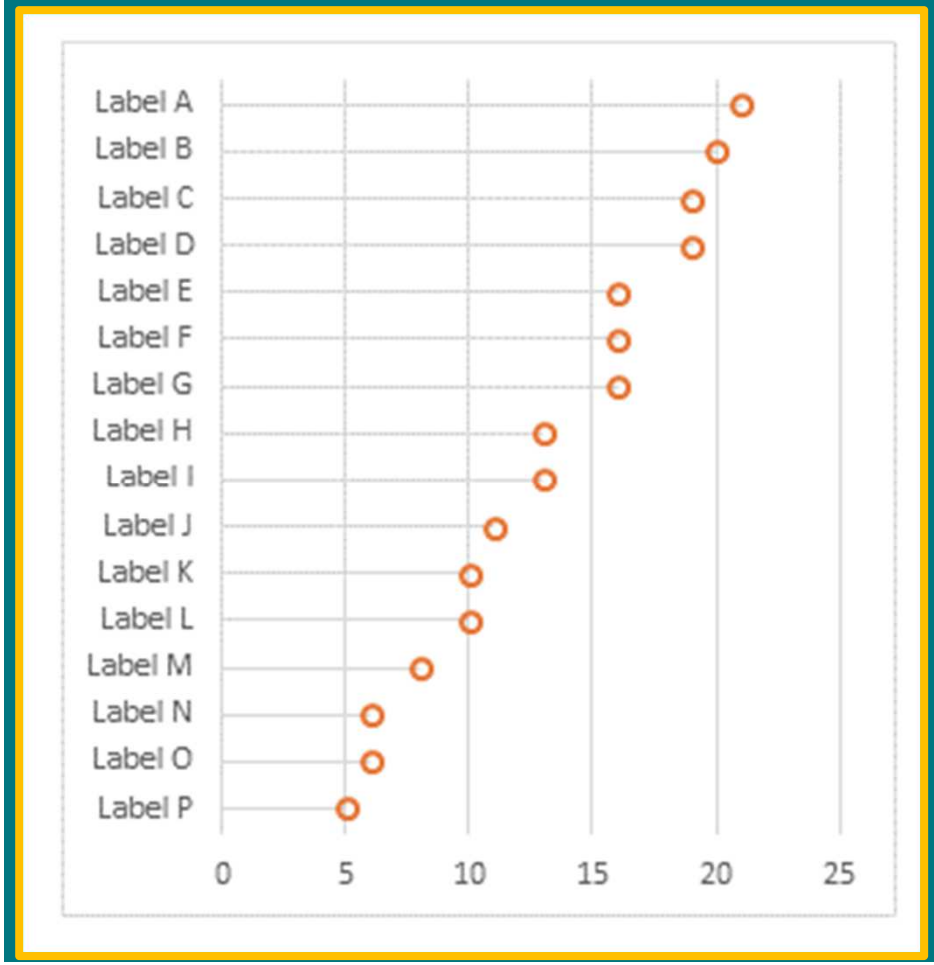
Table 2 Effect of plant spacing and cultivar on growth, yield and yield parameters of lettuce

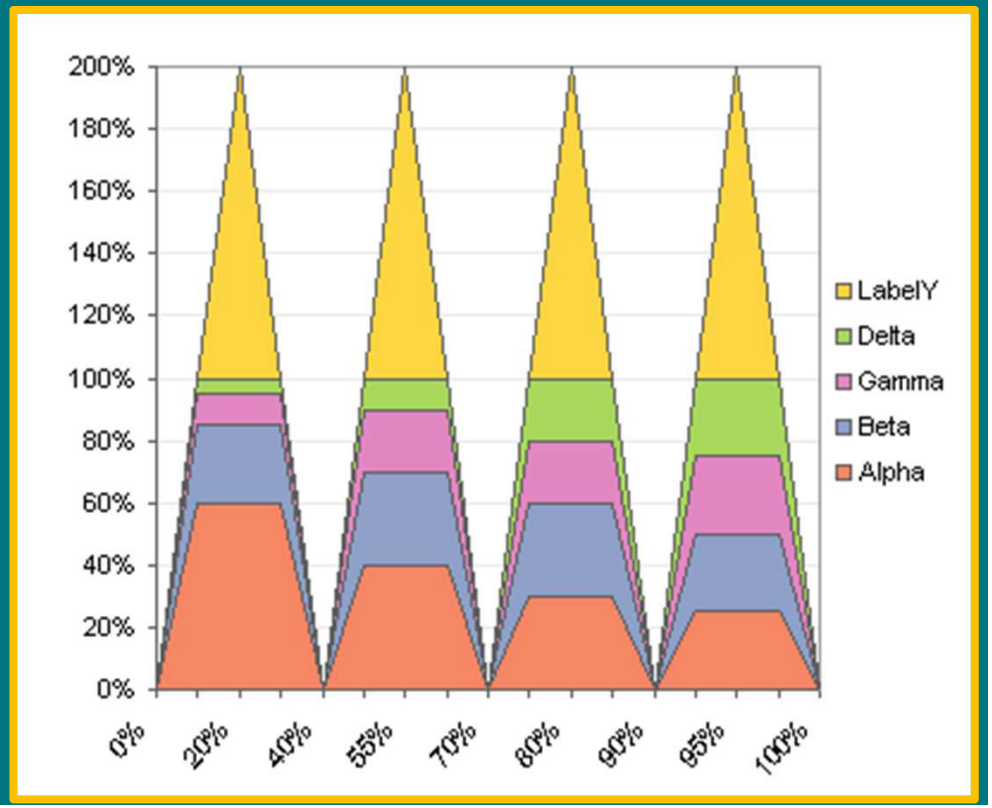
Treatment combination		Plant height (mm)	Number of leaves m^{-2}	Fresh mass (g m^{-2})	Leaf area (cm^2 m^{-2})	Leaf dry mass (g m^{-2})	Moisture loss after (% $plant^{-1}$)	
							7 days	14 days
Cultivar	Spacing (cm)							
Natividad	10 x 20	150.8	711.2	3121.0fg	36450	169.3def	34.38	54.96a
	10 x 25	153.5	533.3	2183.0ghij	26988	112.8hi	32.13	55.72a
	15 x 20	126.8	466.7	2085.0hijk	22811	125.8fgh	33.02	53.44a
	20 x 20	130.1	372.2	1758.0ijk	18131	99.2hij	42.09	62.56b
	20 x 25	120.7	255.5	1115.0k	10250	60.2j	40.41	64.69b
NIZ 44-675	10 x 20	215.7	900.0	5948.0a	75360	282.0ab	34.04	48.13a
	10 x 25	218.9	671.1	5202.0abc	55344	241.3bc	31.38	44.96a
	15 x 20	187.9	606.7	4374.0cde	47468	202.1cd	31.15	46.08a
	20 x 20	185.4	491.7	3671.0ef	38786	195.5cd	31.53	45.70a
	20 x 25	165.2	428.9	2465.0ghi	32028	141.9efgh	30.64	44.37a
Nougatine	10 x 20	201.0	744.3	2905.0fgh	41360	141.8efgh	38.06	52.01a
	10 x 25	194.8	568.9	2615.0ghi	34646	124.1fgh	37.89	50.69a
	15 x 20	163.9	446.6	1808.0ijk	30657	116.5ghi	39.19	52.52a
	20 x 20	157.3	411.2	1787.0ijk	23060	109.4hi	34.95	48.92a
	20 x 25	140.2	322.2	1270.0jk	16010	70.3ij	40.59	52.79a
Tango	10 x 20	221.1	1000.0	5638.0ab	56535	296.2a	35.28	51.71a
	10 x 25	201.3	720.0	4732.0bcd	46559	260.4ab	39.89	58.29b
	15 x 20	183.8	620.0	3798.0def	35183	193.4d	36.06	51.39a
	20 x 20	166.1	502.7	3119.0fg	30262	186.4de	32.00	45.44a
	20 x 25	162.4	393.3	2362.0ghi	22103	158.8defg	35.58	52.35a
$LSD_{0.05}$		ns	ns	1004.2	ns	46.60	ns	11.14

John Peltier

PeltierTech.com

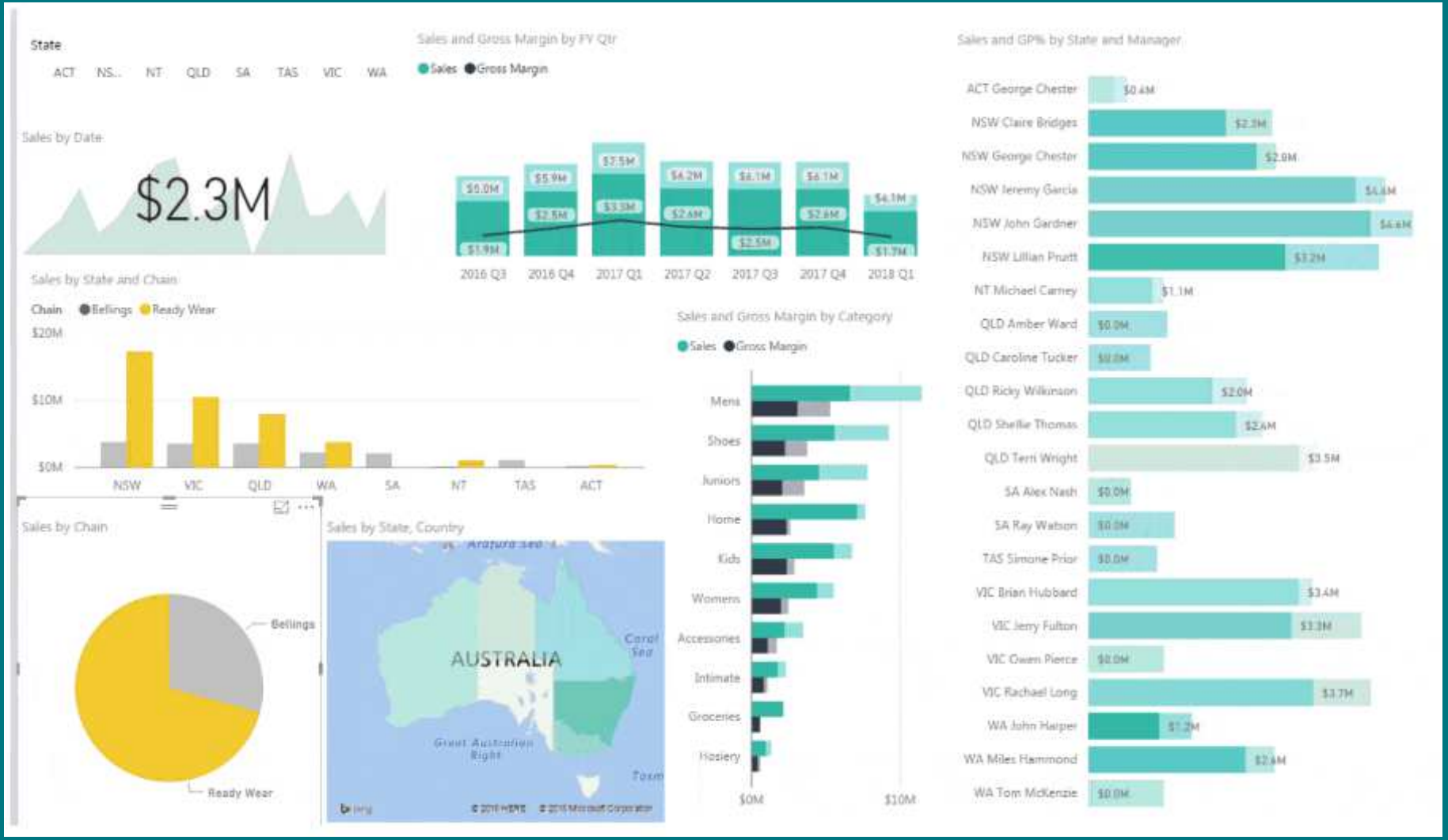
The Chart Guru – excellent step-by-step directions for complicated charts.



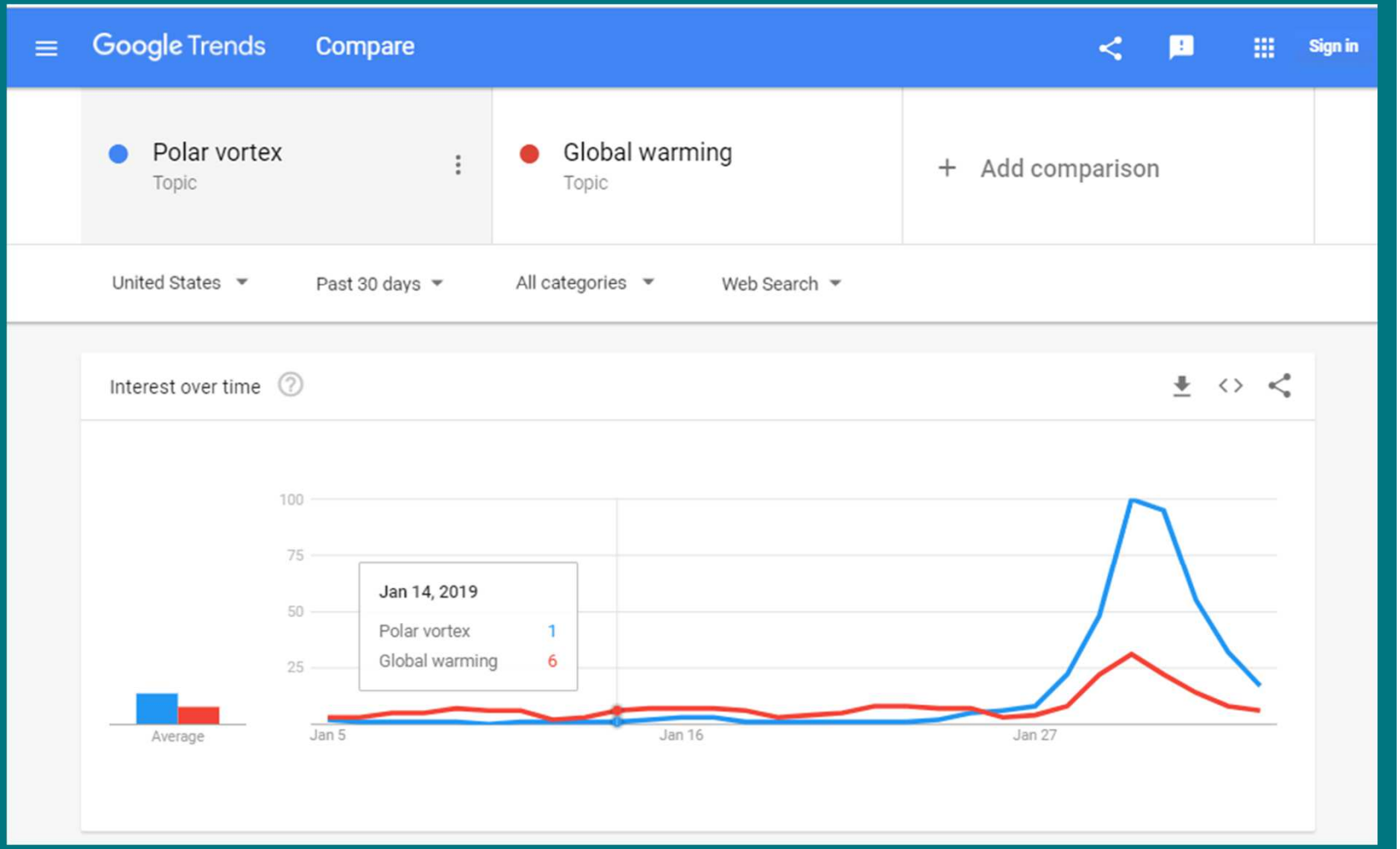


Mynda Treacy www.myonlinetraininghub.com

Dashboards and Power BI classes. Some webinars are free.



Google Trends:
Compare two search terms




children
Believe
praise
Lord
Father
Creation
question
grow
love
beginning
Alright
dirty
whose
remarks
right
Holy
fight
crying
feel
hopeless
just
thinner
save
Hear
place
One
Whoa
Sayin
doom
pleading
sinner
comes
ask
pity
song
get
whoa
really
end
hiding
Let
hurt
heart
ain't
Man
one
mankind
Armageddon
thing
pass
will
chances
shall

Word Cloud

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