

Ethical and Deceptive Visualization



Michael Correll
Tableau Research

Questions

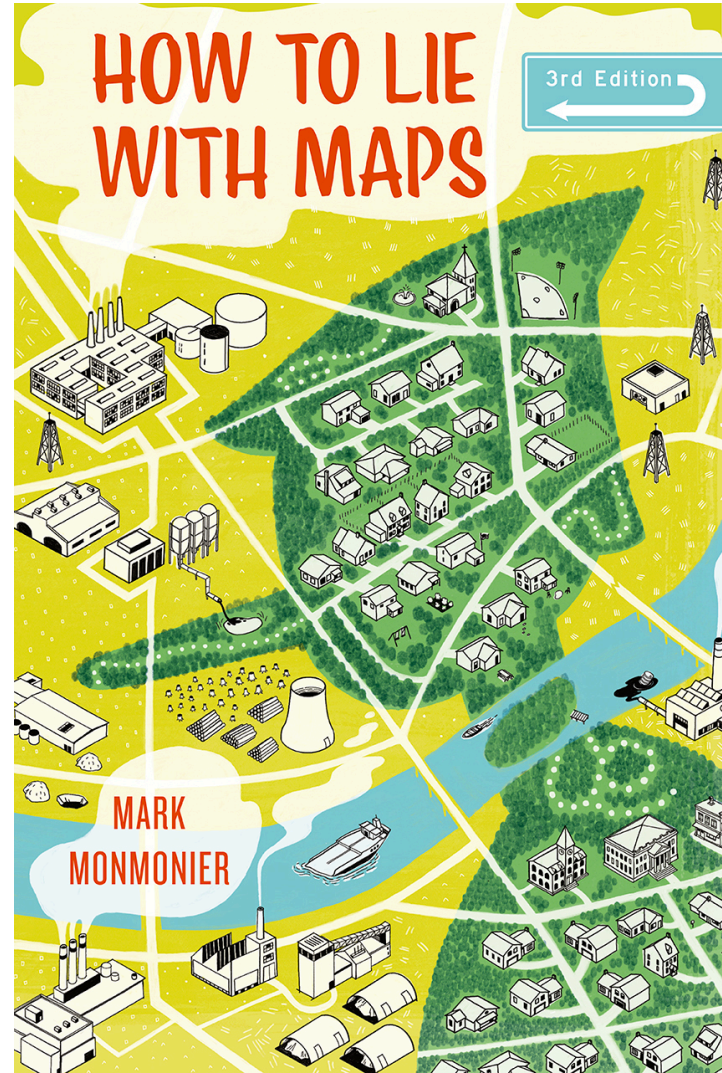
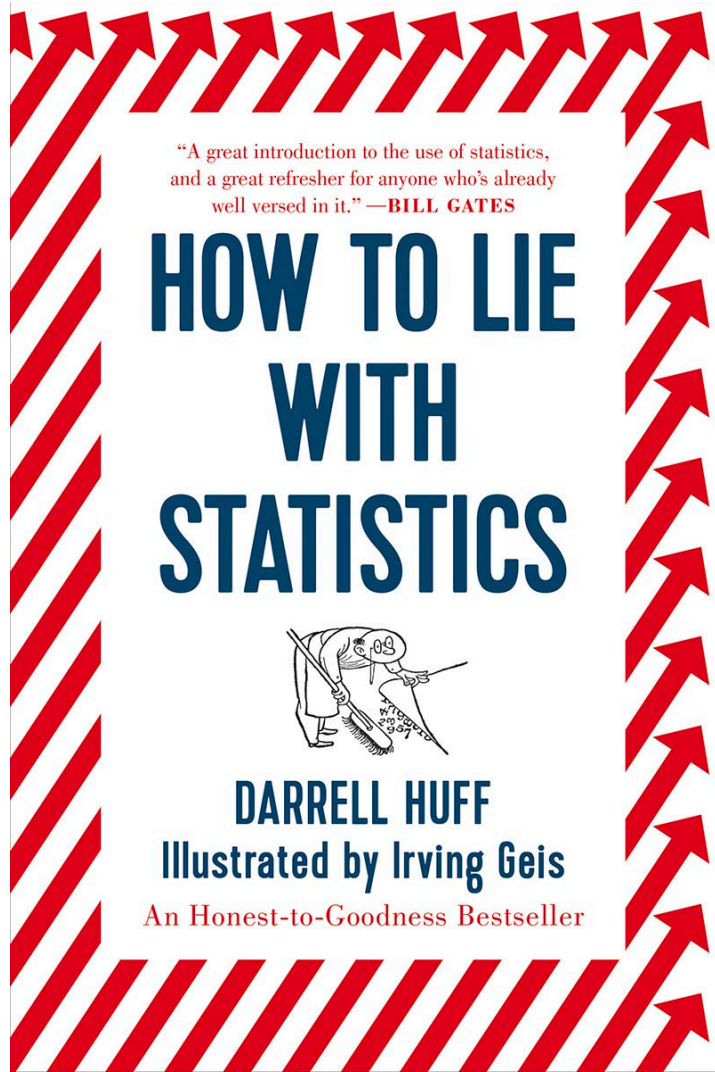
What Makes A Visualization *Deceptive*?

What Makes a Visualization *Ethical*?

Questions

What Makes A Visualization *Deceptive*?

What Makes a Visualization *Ethical*?



Bad Visualizations

Incorrect Visualizations

Illegible Visualizations

Bullshit Visualizations

Deceptive Visualizations

Incorrect Visualization

2010 Georgia Approval Ratings by Region
 In a Georgia Newspaper Partnership poll, residents were asked how they approved or disapproved of their government. Select a politician or legislative branch to see how Georgia residents rated them.

BARACK OBAMA
 U.S. CONGRESS
 G.A. STATE LEGISLATURE
 SONNY PERDUE

Statewide Results:

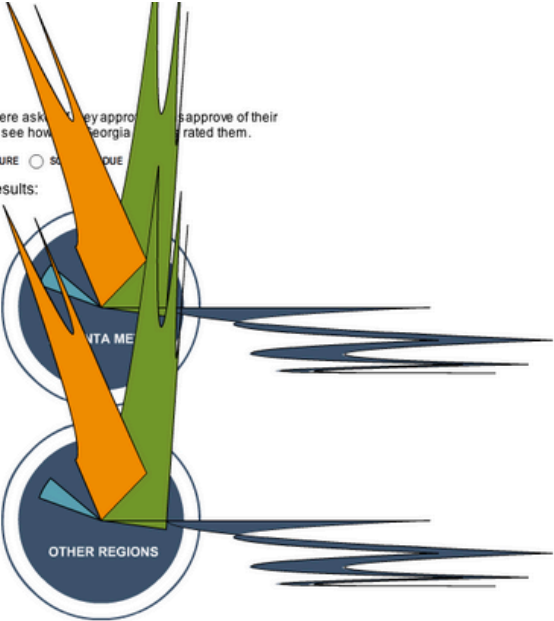

Barack Obama
 Approve: 37 %
 Disapprove: 52 %
 Not Sure: 11 %


U.S. Congress
 Approve: 21 %
 Disapprove: 60 %
 Not Sure: 19 %

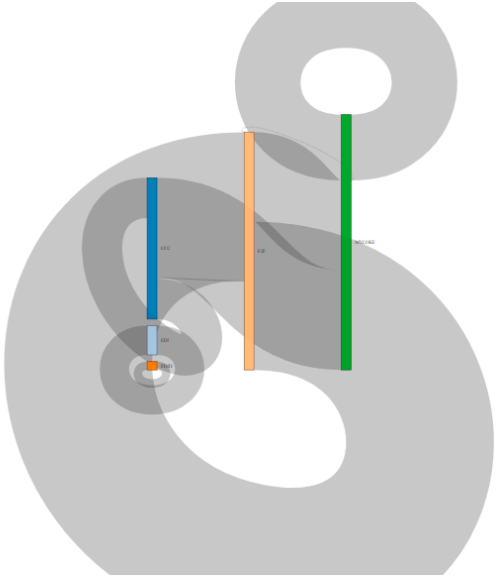

State Legislature
 Approve: 39 %
 Disapprove: 37 %
 Not Sure: 24 %


Sonny Perdue
 Approve: 45 %
 Disapprove: 42 %
 Not Sure: 13 %

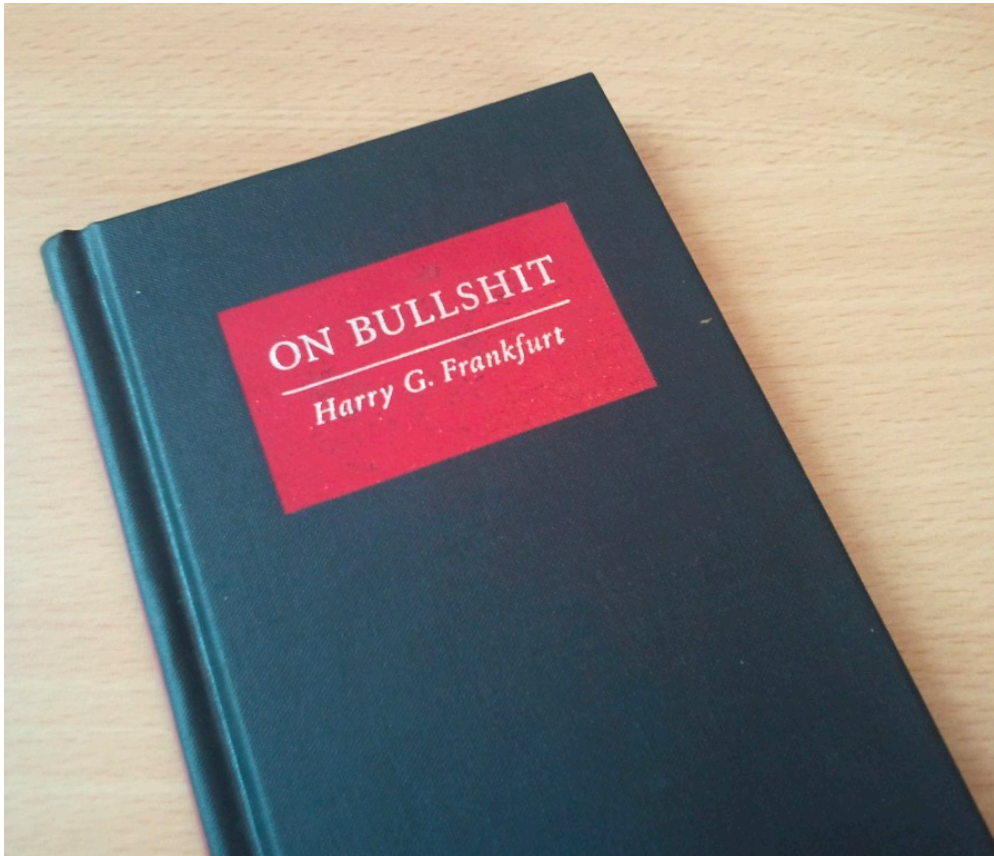
Regional Results:



Percent of Polled Residents
 Approve Disapprove Not Sure



Bullshit Visualization



Lie:

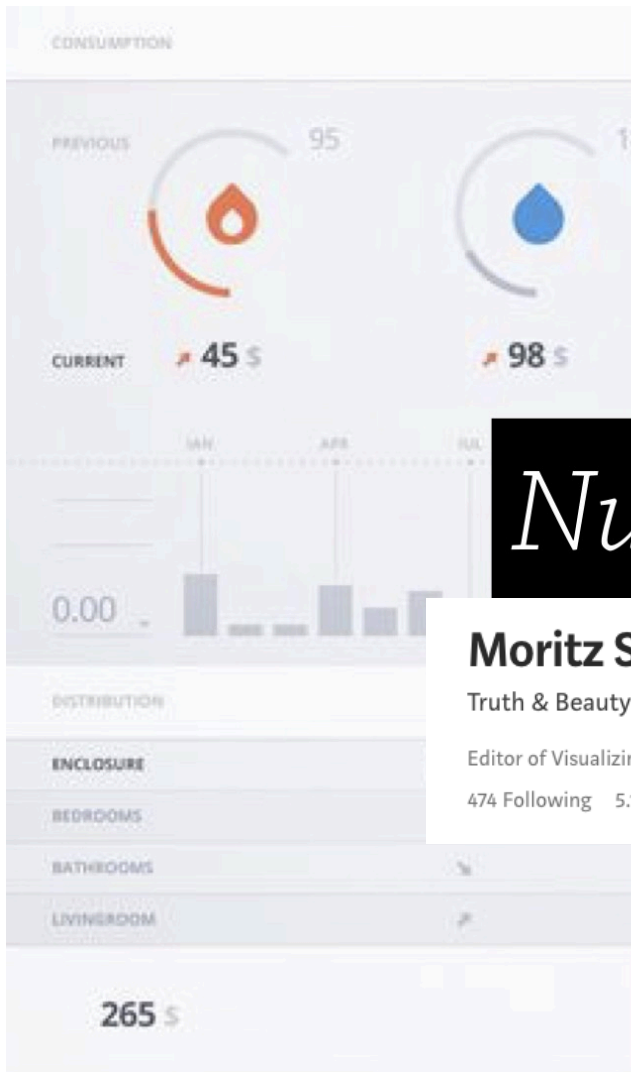
“No, officer, I wasn’t speeding”

(you know the truth, but intentionally say something you know is untrue)

Bullshit:

“The party was lame anyways, it’s good I wasn’t invited”

(you don’t know or don’t care about the truth, but intentionally say something you hope is persuasive)



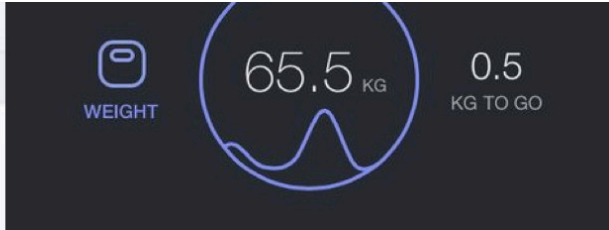
Number decoration

Moritz Stefaner [Follow](#)

Truth & Beauty Operator

Editor of Visualizing, The Field

474 Following · 5.1K Followers



CTOOLS FAN PAGE

33,123 FANS ▲3%

COMMENTS ON CTOOLS POST ▼4%

LIKES FOR CTOOLS POST ▲1%

VISITS VS COMMENTS

TOTAL FOLLOWERS **1,987** FOLLOWERS ▲3%

CTOOLS TRAINING POSTS **43%** ▲1%

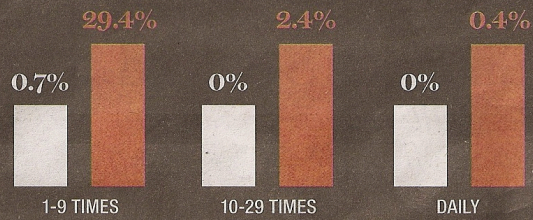
Registered Trainees

Trainees	Age	Mail	Activity	Share	Likes
David Truty	20	davidtruty@gmail.com	Student	5	1
Robin Lazenby	23	robin@collect.com	Programmer	4	3
Braden Barber	34	bradonbb@gmail.com	Student	1	1

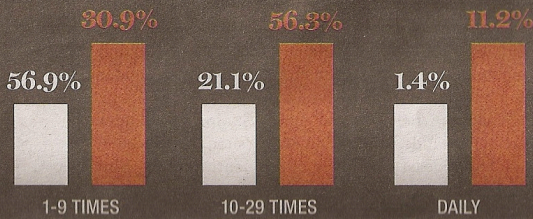
BY THE NUMBERS

The National Collegiate Health Assessment was taken by 1,000 UCSB students in Spring 2009. Participants were asked how frequently they used substances over the past 30 days. Numbers in white reflect actual student use, while red numbers indicate perceived substance use. The average age of participants was 20 years and approximately 99 percent were full-time students.

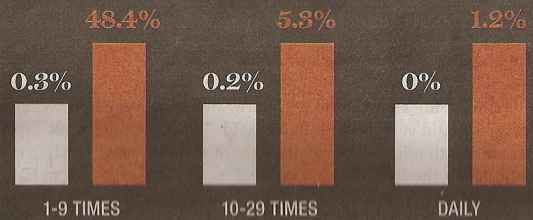
OPIATES



ALCOHOL

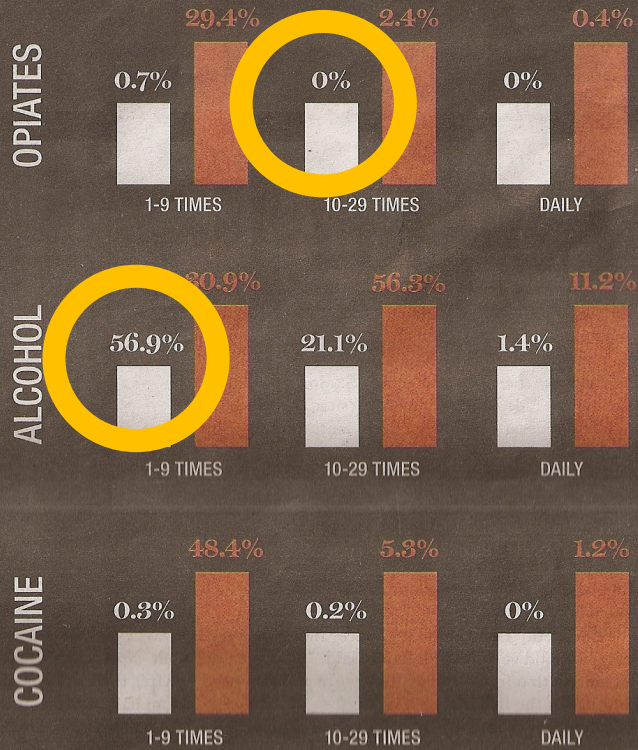


COCAINE



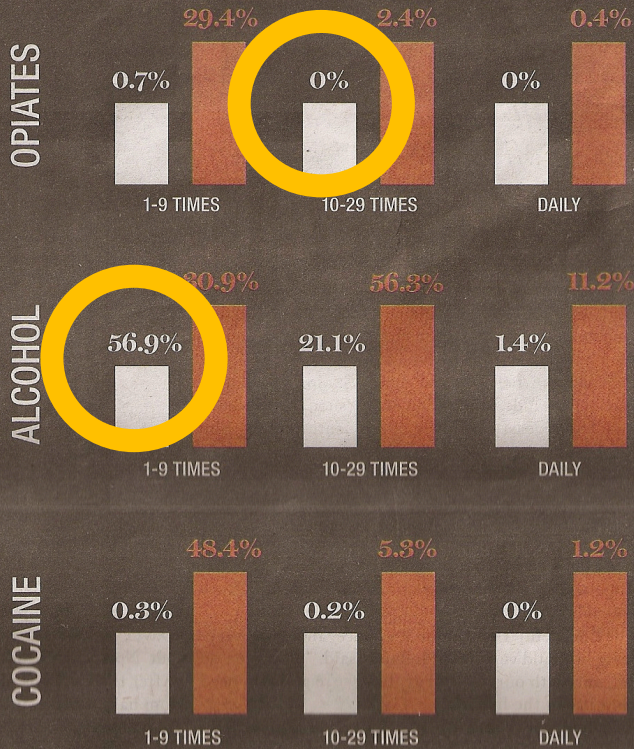
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	1-9 Times		10-29 Times		Daily	
Alcohol	Actual	56.9	21.1	56.3	1.4	11.2
	Perceived	30.9	56.3			
Cocaine	Actual	0.3	0.2	0.0	0.0	1.2
	Perceived	48.4	5.3			
Opiates	Actual	0.7	0.0	0.0	0.0	0.4
	Perceived	29.4	2.4			

UNEMPLOYMENT RATE UNDER PRESIDENT OBAMA



UNEMPLOYMENT RATE UNDER PRESIDENT OBAMA



UNEMPLOYMENT RATE UNDER PRESIDENT OBAMA



UNEMPLOYMENT RATE UNDER PRESIDENT OBAMA

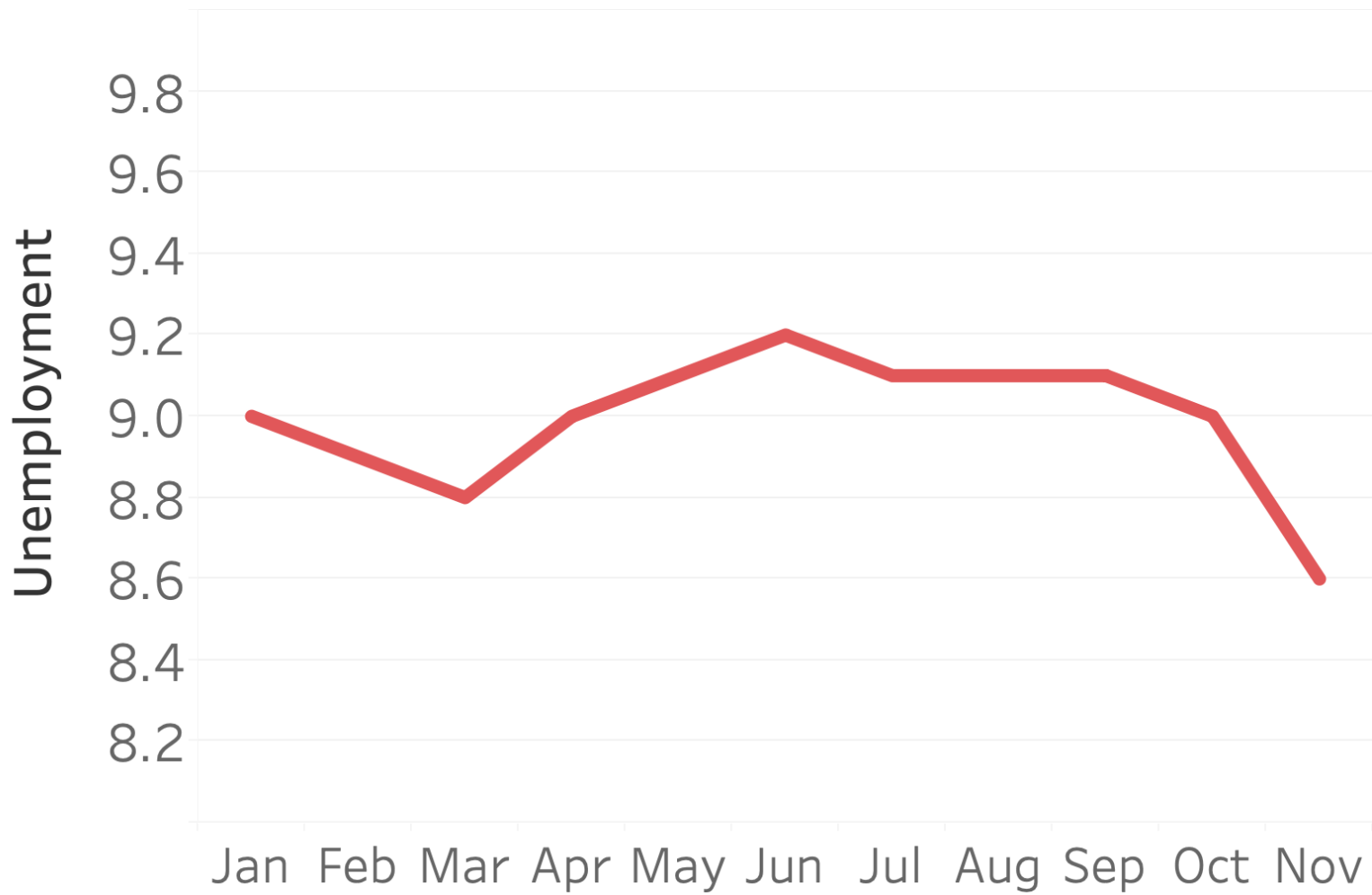


UNEMPLOYMENT RATE UNDER PRESIDENT OBAMA



UNEMPLOYMENT RATE UNDER PRESIDENT OBAMA





Deceptive Visualization

The background features a sparse, abstract pattern of black geometric shapes on a white background. These shapes include thin diagonal lines, small circles, and 'x' marks scattered across the page. The central text is framed by several horizontal lines, some of which are slightly wavy or broken.

DARK PATTERNS

(They're Everywhere)

Dark Patterns

The screenshot shows a web browser window displaying the Softpedia page for 'OnyX for Mac'. The page features a prominent blue 'DOWNLOAD NOW' button and a 'Start Download' section with a three-step process: 1. Click Download, 2. Run the quick scan, 3. Enjoy your clean Mac. Below this, there is a 'Download Cleaner' advertisement with an image of a person using a laptop. The page also includes a sidebar with 'CURRENT VERSION' (OnyX 3.2.1), 'FILE SIZE' (34.8 MB), and 'RUNS ON' (macOS 10.12 or later). The main content area describes OnyX as a free OS X application for optimization and maintenance tasks.

OnyX Download Mac

mac.softpedia.com/get/System-Utilities/OnyX.shtml

SOFTPEDIA* DESKTOP Mac MOBILE WEB NEWS

Softpedia > Mac > System Utilities > OnyX

ALERT 2016 Holiday Giveaways!

OnyX for Mac

DOWNLOAD 177,446 downloads Updated: October 15th, 2016 DONATIONWARE 3.5/5 260

CURRENT VERSION: OnyX 3.2.1 SEND US AN UPDATE

17 SCREENSHOTS

IN-DEPTH REVIEW OnyX in-depth review

FILE SIZE: 34.8 MB

RUNS ON: macOS 10.12 or later (Intel only)

CATEGORY: Home | System Utilities

DEVELOPER:

EDITOR'S REVIEW DOWNLOAD SPECIFICATIONS CHANGELOG 100% CLEAN REPORT MALWARE

Free OS X application designed to help you perform a large variety of optimization, maintenance, and customization tasks via a very simple and intuitive interface

Twinking applications for macOS come in various shapes and prices, and you are free to pick the one that meets your needs, be it focused on finding and fixing as many system errors and problems as possible or on boosting your Mac's overall performance.

Onyx is a free and very complex macOS application created to cope with both these aspects, while also providing its users with a very simple and intuitive interface.

It has a version for each specific macOS version, so download the

Download Cleaner

Dark Patterns

The screenshot shows the Softpedia website for the application 'OnyX for Mac'. The page features a navigation bar with 'SOFTPEDIA', 'DESKTOP', 'Mac', 'MOBILE', 'WEB', and 'NEWS'. A breadcrumb trail indicates the path: 'Softpedia > Mac > System Utilities > OnyX'. A blue 'DOWNLOAD' button is highlighted with an orange box. Below it, the current version is 'OnyX 3.2.1' and the file size is '34.8 MB'. A 'Start Download' section is highlighted in pink, containing a 'DOWNLOAD NOW' button and a three-step process: '1. Click Download', '2. Run the quick scan', and '3. Enjoy your clean Mac'. The page also includes an 'EDITOR'S REVIEW' section, a '17 SCREENSHOTS' section, and a '100% CLEAN' badge. A sidebar on the right contains a 'TECHNICAL' link. The overall layout is clean and professional, with a focus on providing clear download instructions and user reviews.



Zone Kaiwei Ni factory
Sponsored

80% OFF
BLACK FRIDAY SALE



[Shop Now](#)



Dark Patterns in Visualization

Lie Factors

Scale Manipulation

Metric Manipulation

Tufte's Lie Factor

Lie Factor =
$$\frac{\text{The size of the effect shown in the graphic}}{\text{The size of the effect in the data}}$$

LF \cong 1 Good!

LF \gg 1 or LF \ll 1 Bad!

Tufte's Lie Factor

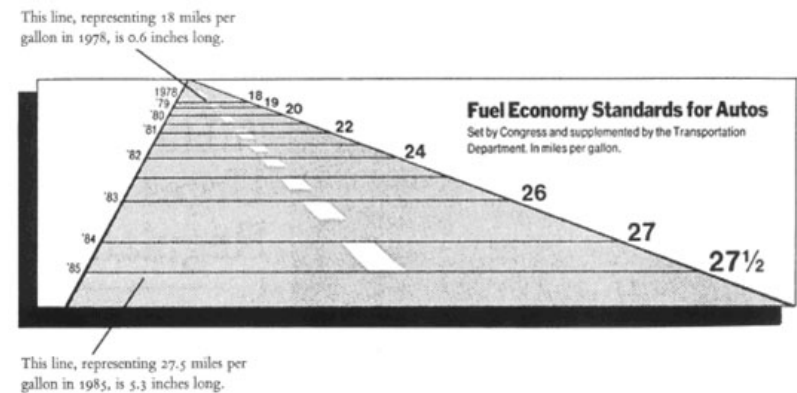
Lie Factor =
The size of the effect shown in the graphic
The size of the effect in the data

LF \cong 1 Good!

LF \gg 1 or LF \ll 1 Bad!

$$LF = [(5.3 - 0.6)/0.6] / [(27.5-18)/18]$$

LF = **14.8!**

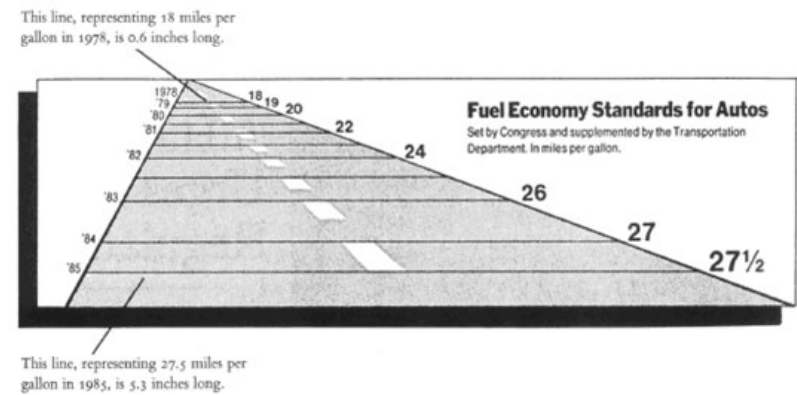


Tufte's Lie Factor

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The size of the effect in the data

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Lie Factor

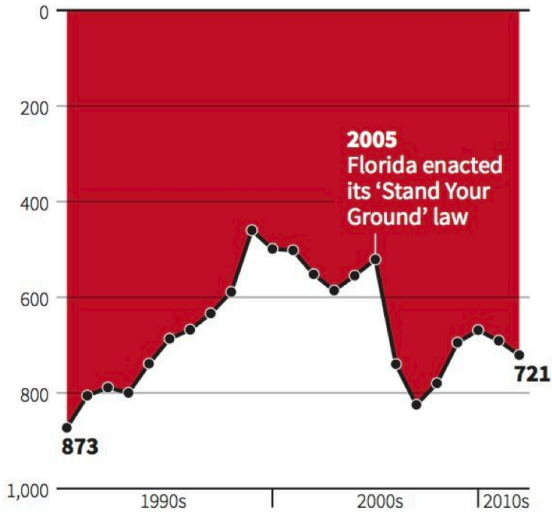
Distorting the apparent size of the effect in your data, often through choosing ambiguous or non-standard encodings.

Scale Manipulation

Scale Manipulation

Gun deaths in Florida

Number of murders committed using firearms



Source: Florida Department of Law Enforcement

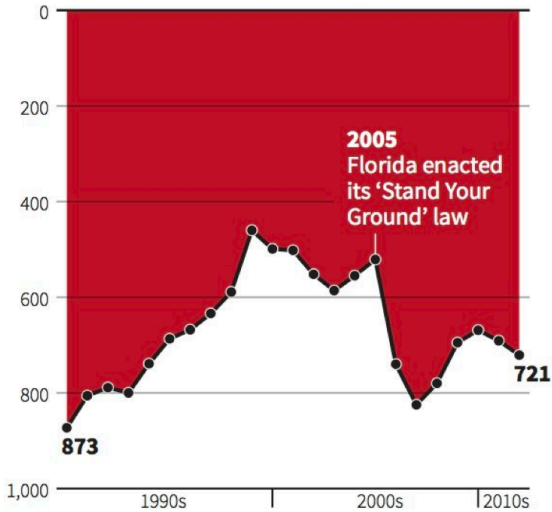
C.Chan 16/02/2014

REUTERS

Scale Manipulation

Gun deaths in Florida

Number of murders committed using firearms



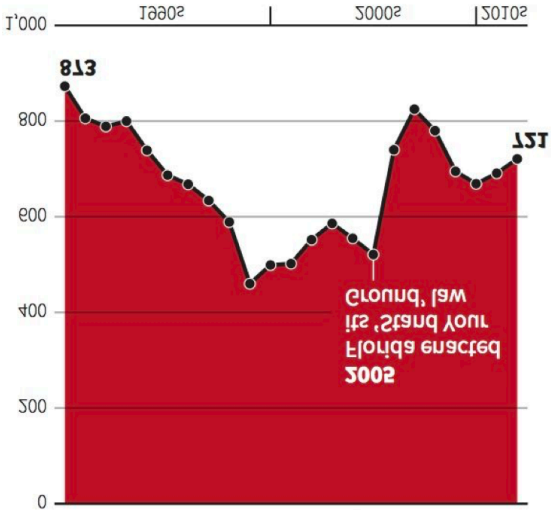
Source: Florida Department of Law Enforcement

C. Chan 16/02/2014



Gun deaths in Florida

Number of murders committed using firearms



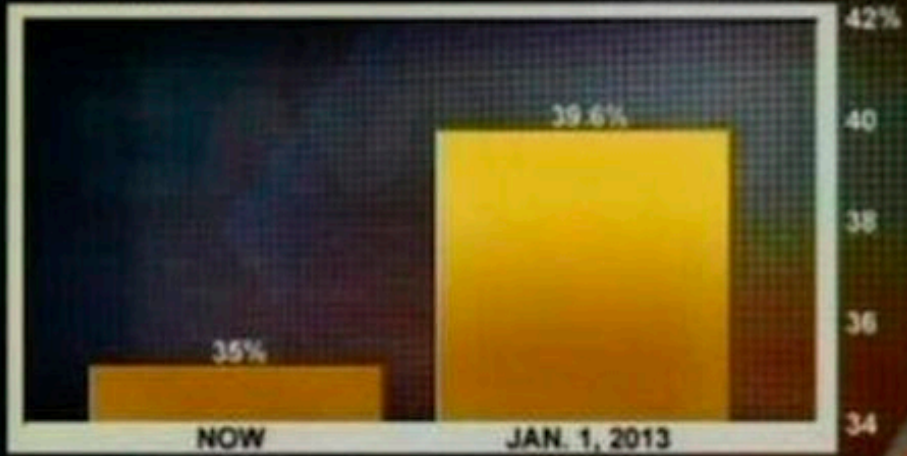
Source: Florida Department of Law Enforcement

C. Chan 16/02/2014



IF BUSH TAX CUTS EXPIRE

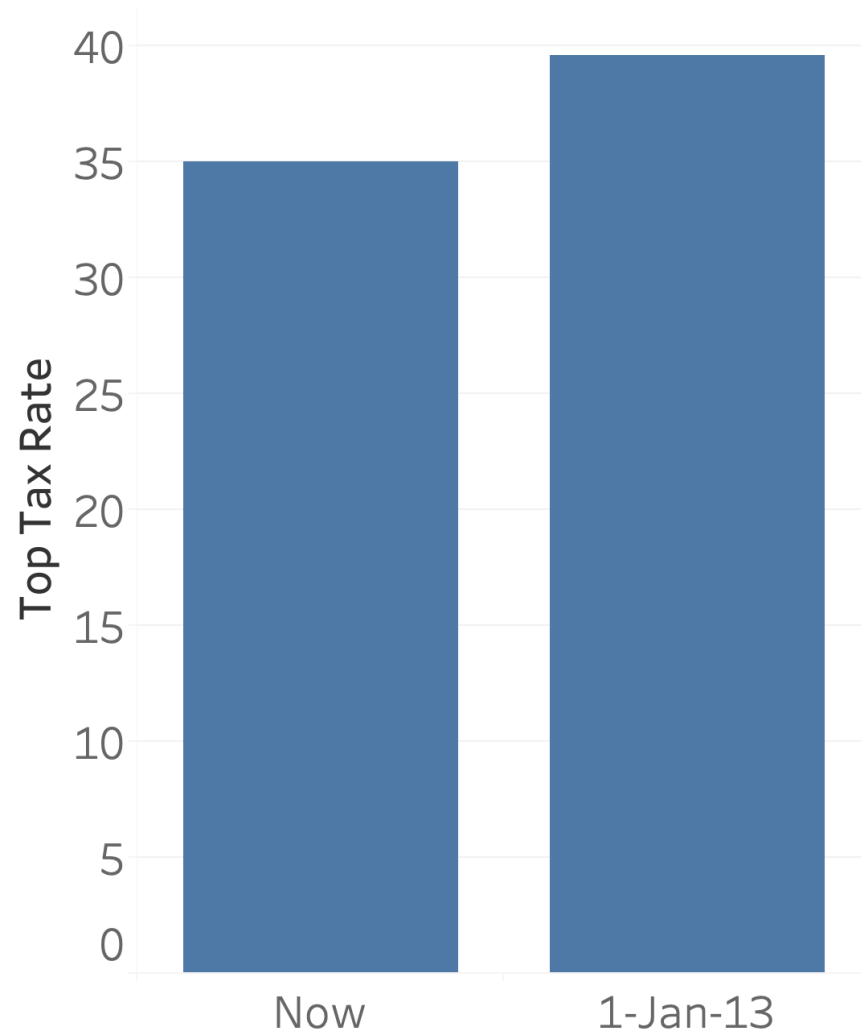
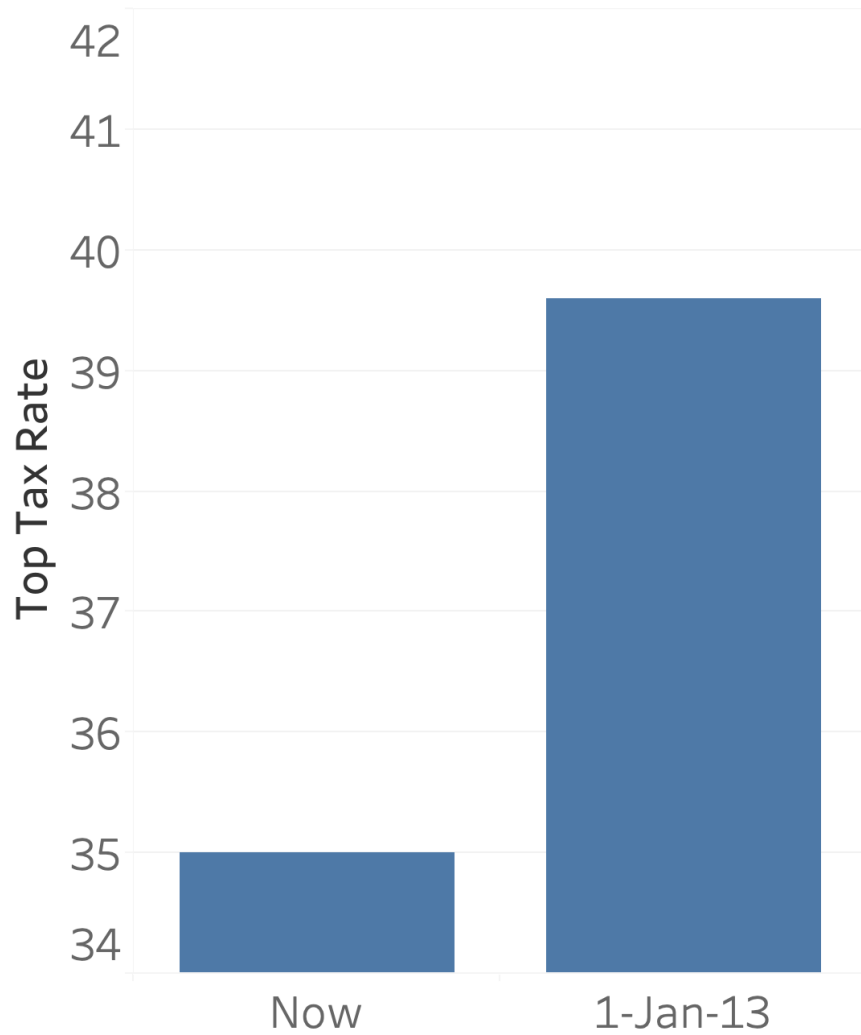
TOP TAX RATE



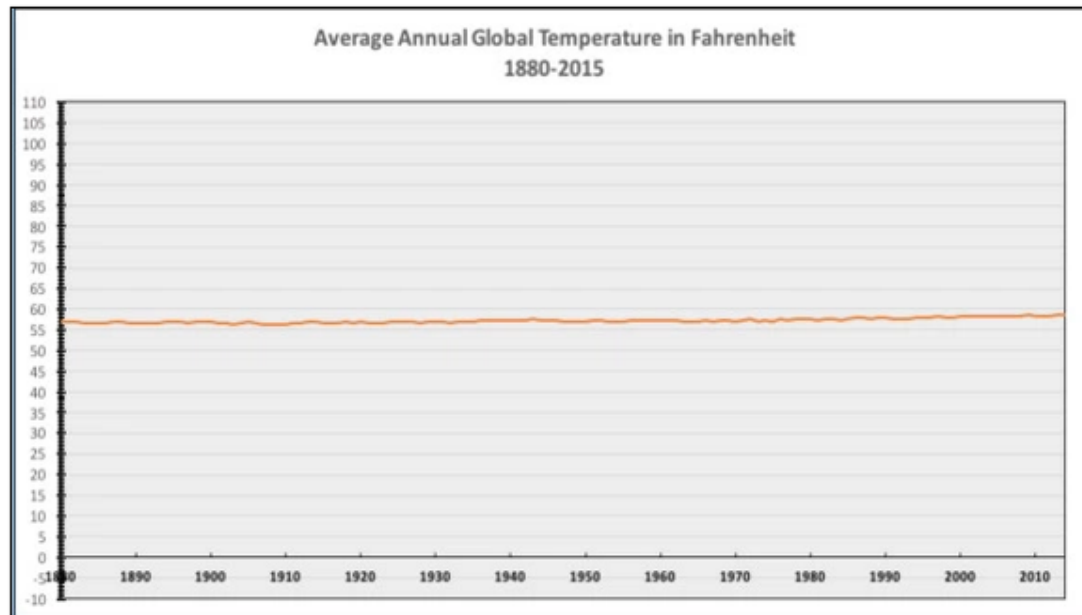
IF BUSH TAX CUTS EXPIRE

TOP TAX RATE





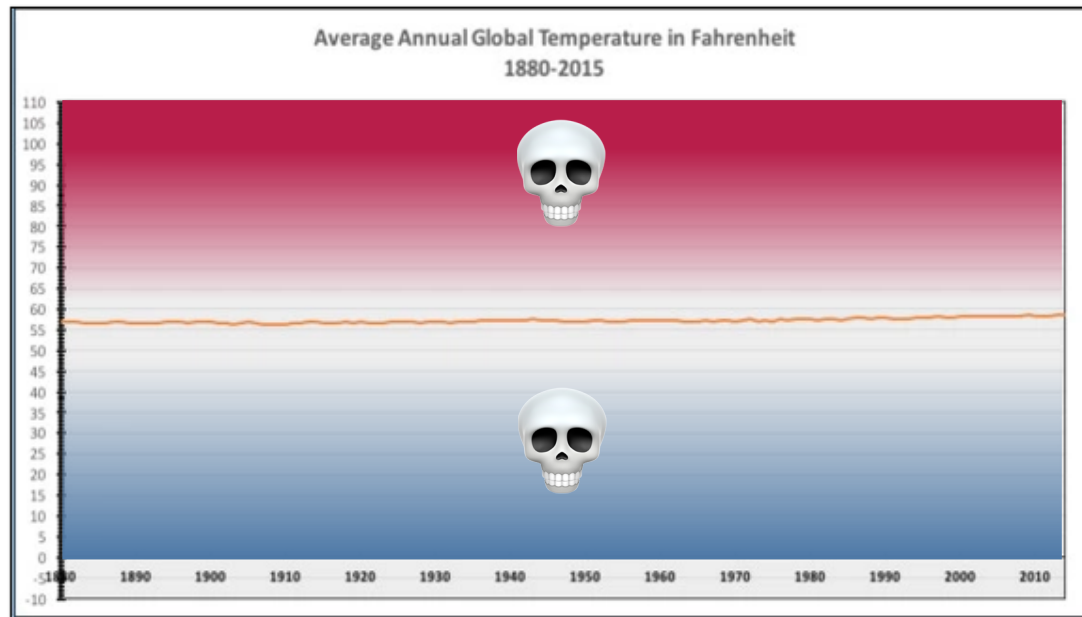
“The Only Climate Change Graph You’ll Ever Need”



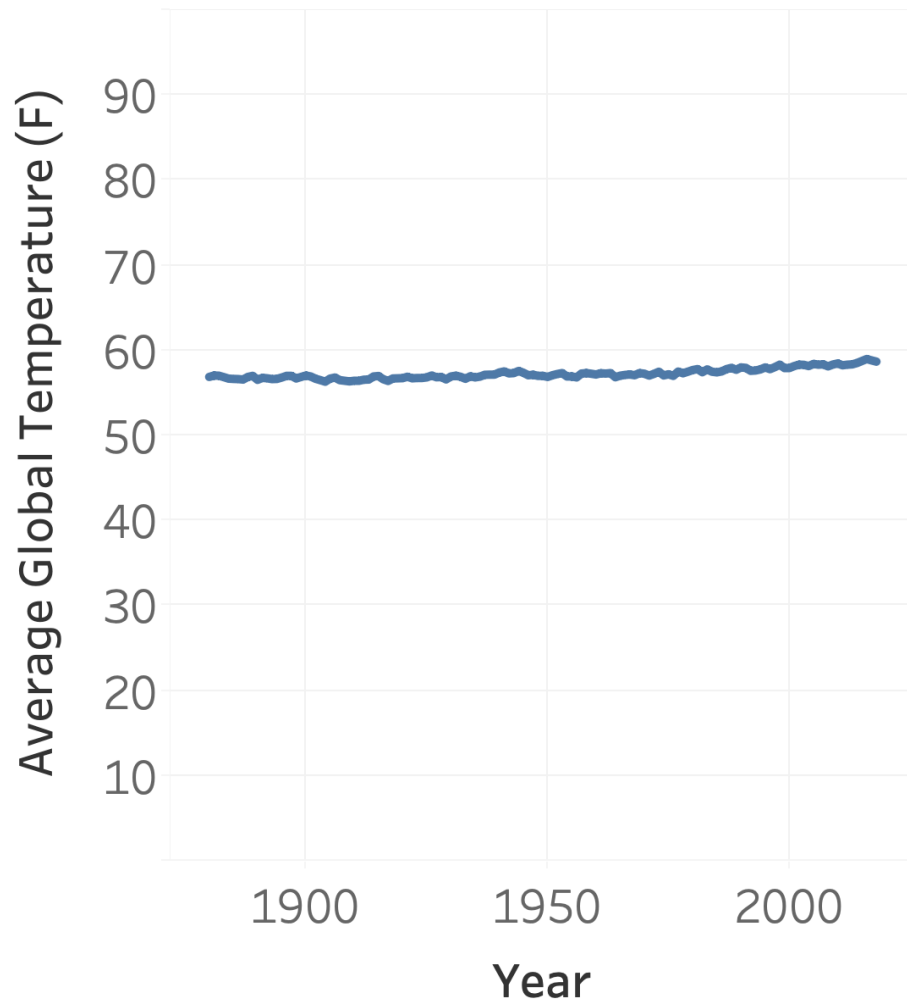
Average Annual Global Temperature in Fahrenheit
1880-2015



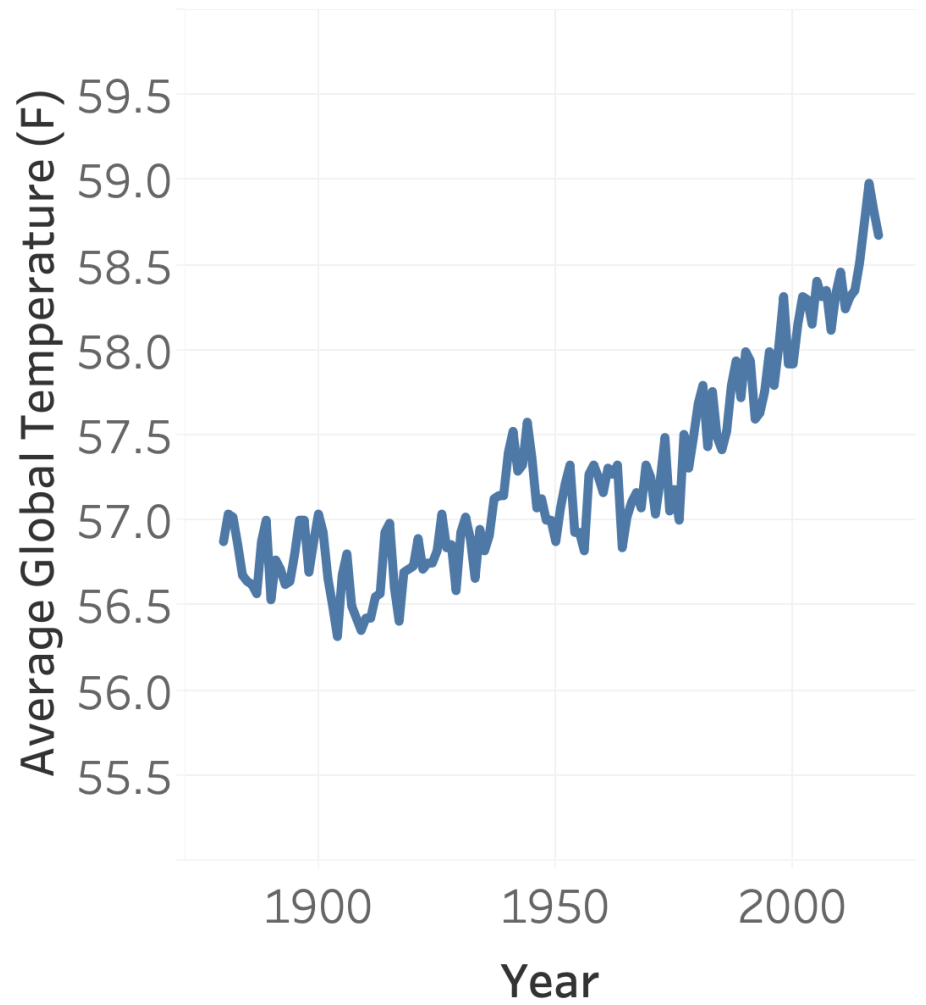
“The Only Climate Change Graph You’ll Ever Need”



NRO



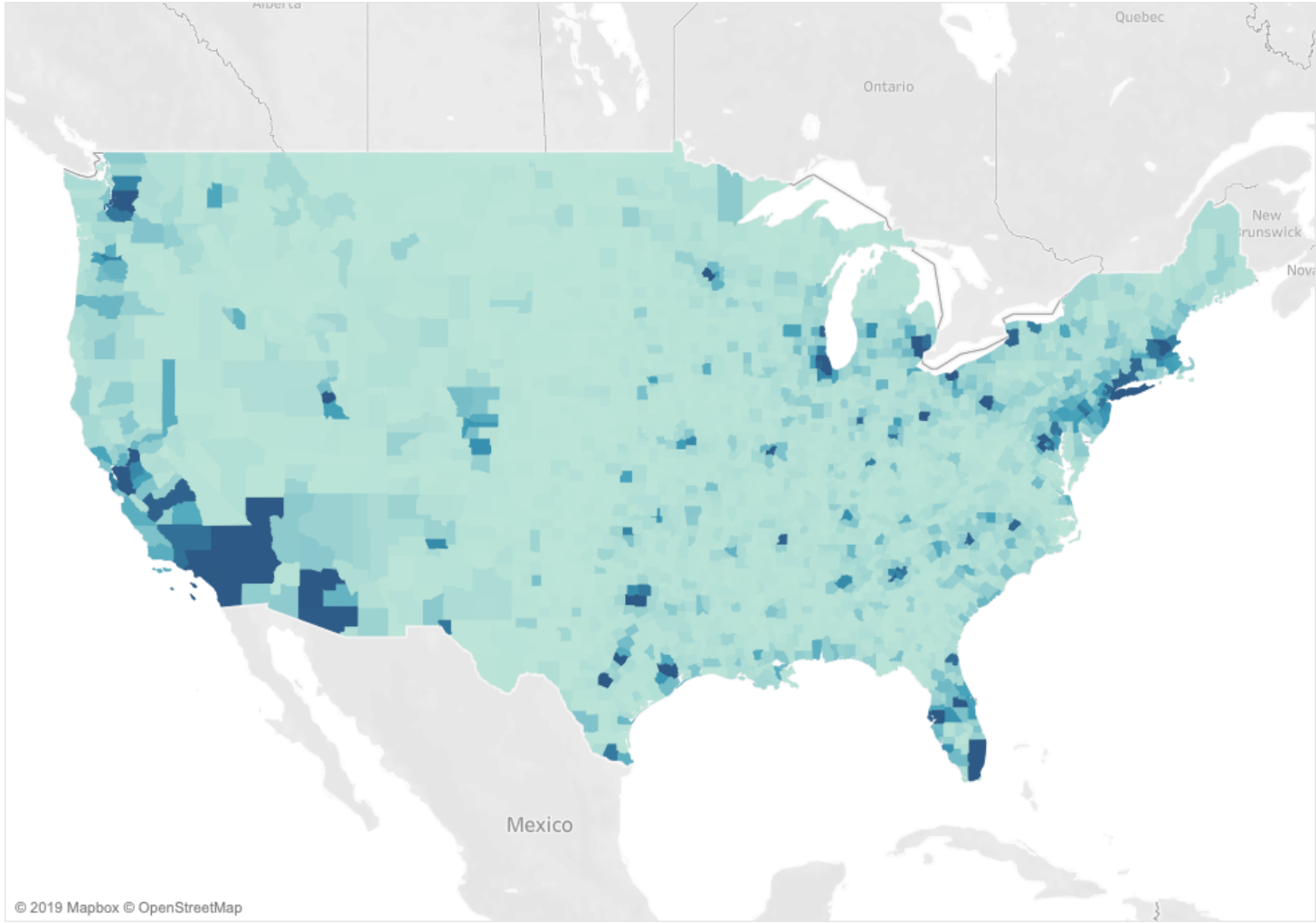
NRO (Truncated)

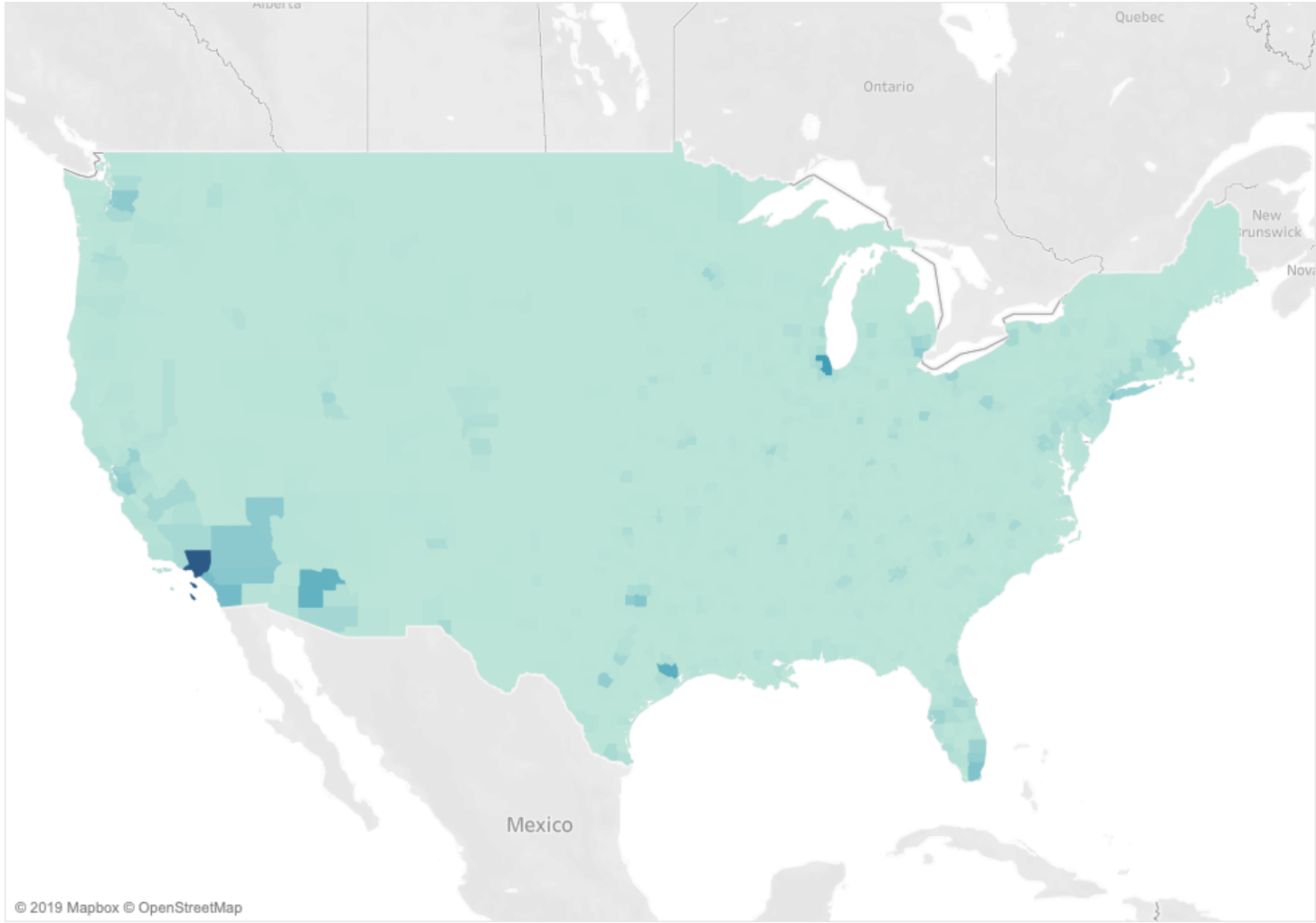


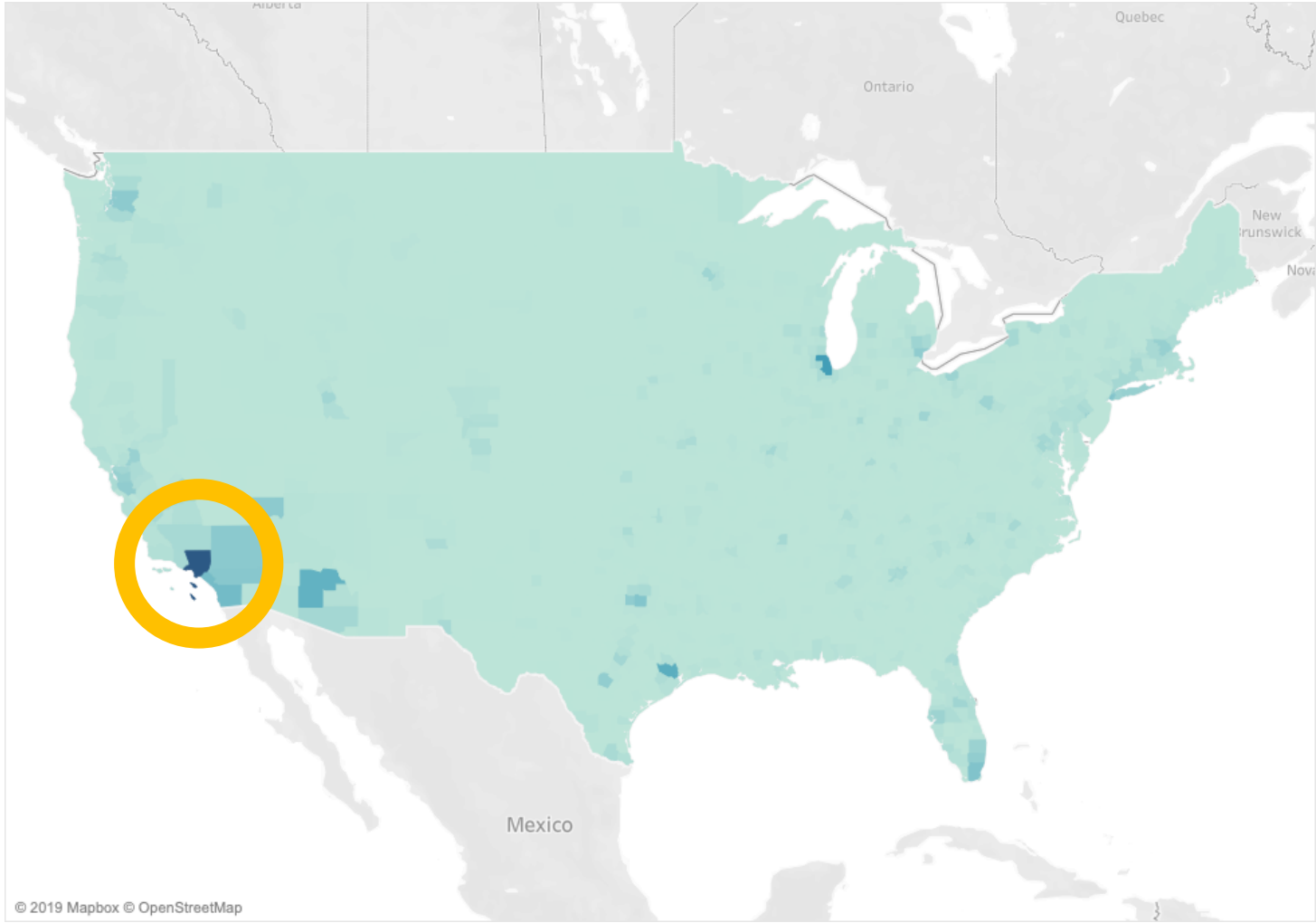
Scale Manipulation

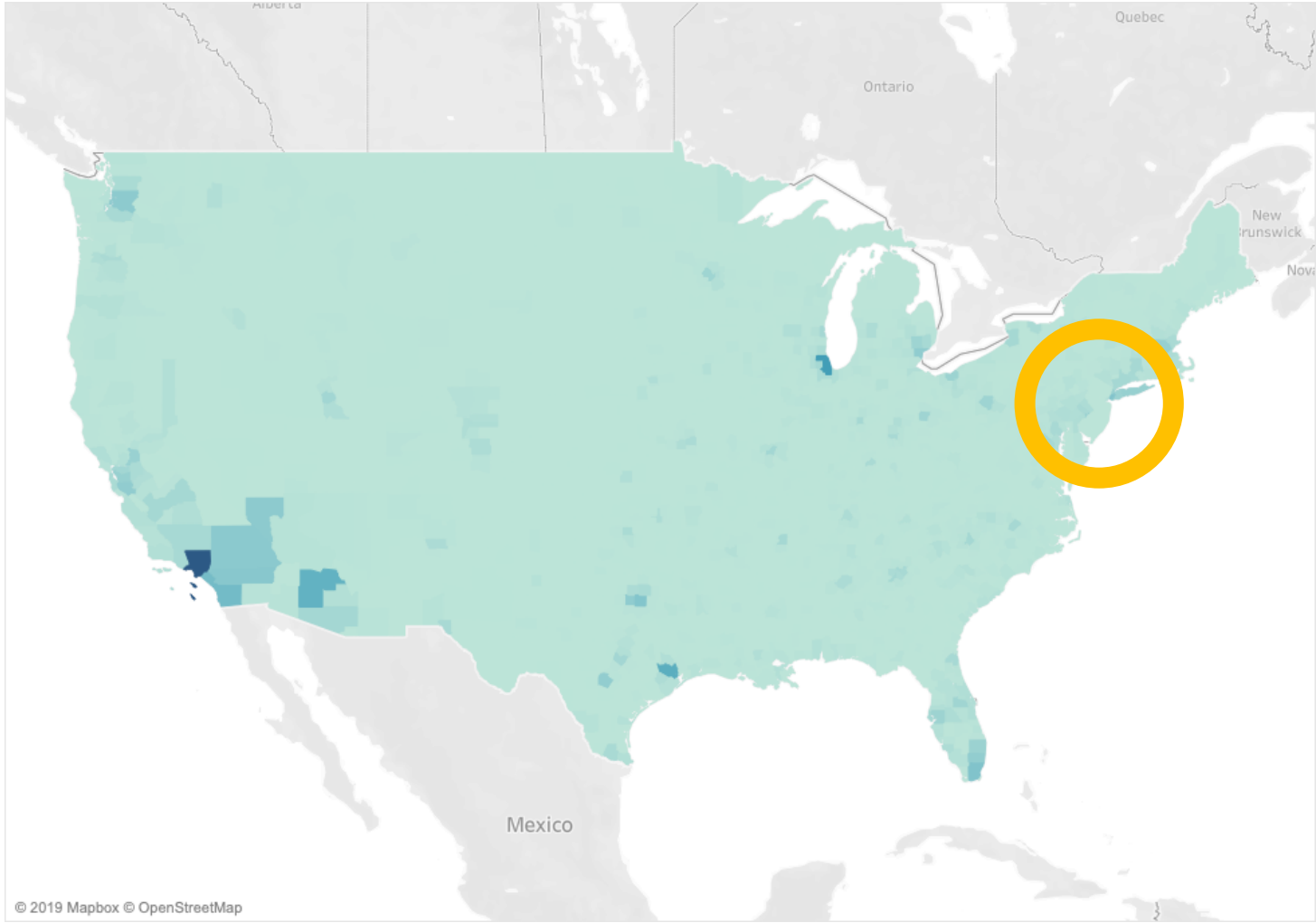
Changing with the scales of your chart to minimize, magnify, or invert the change in the data.

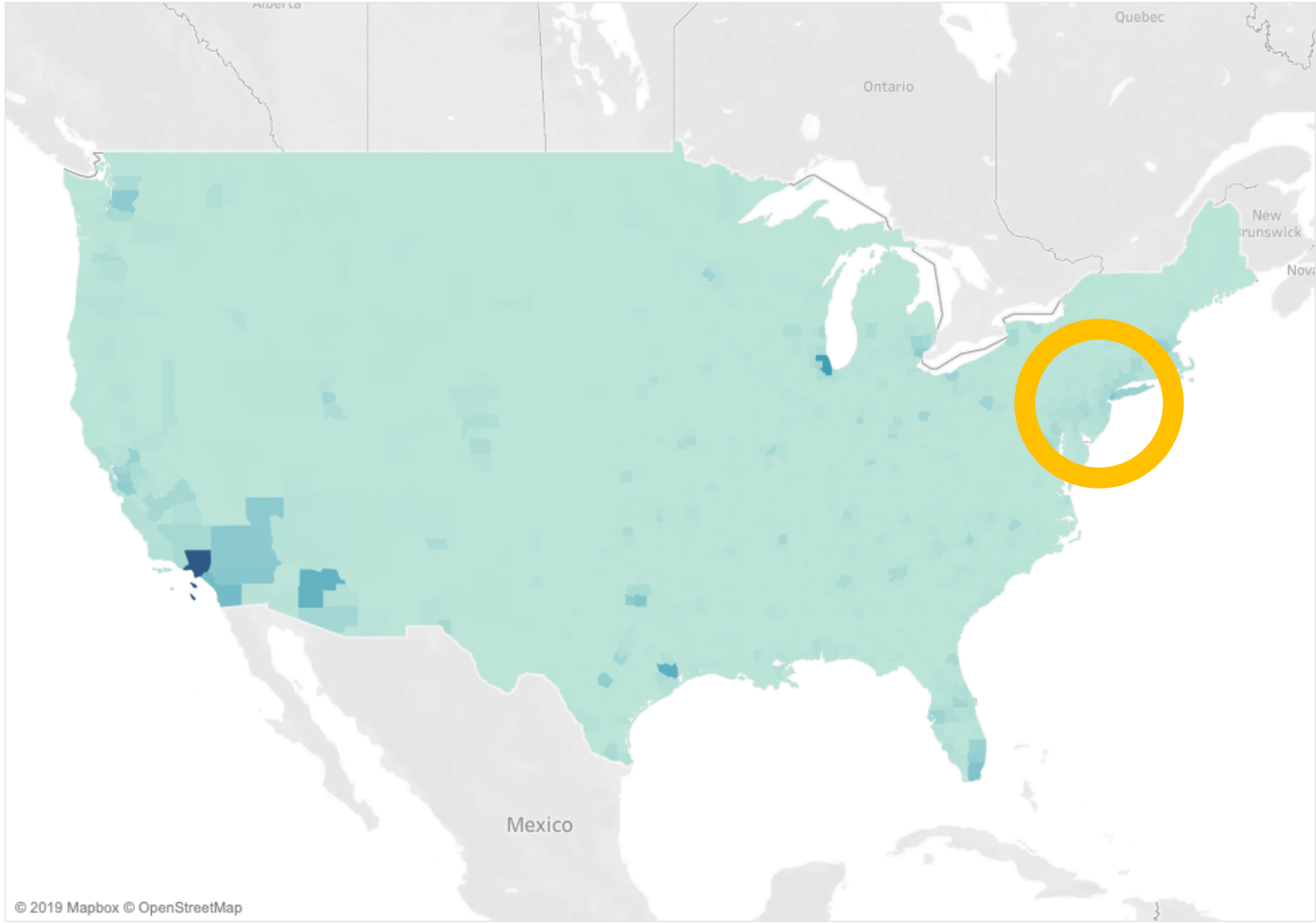
Metric Manipulation

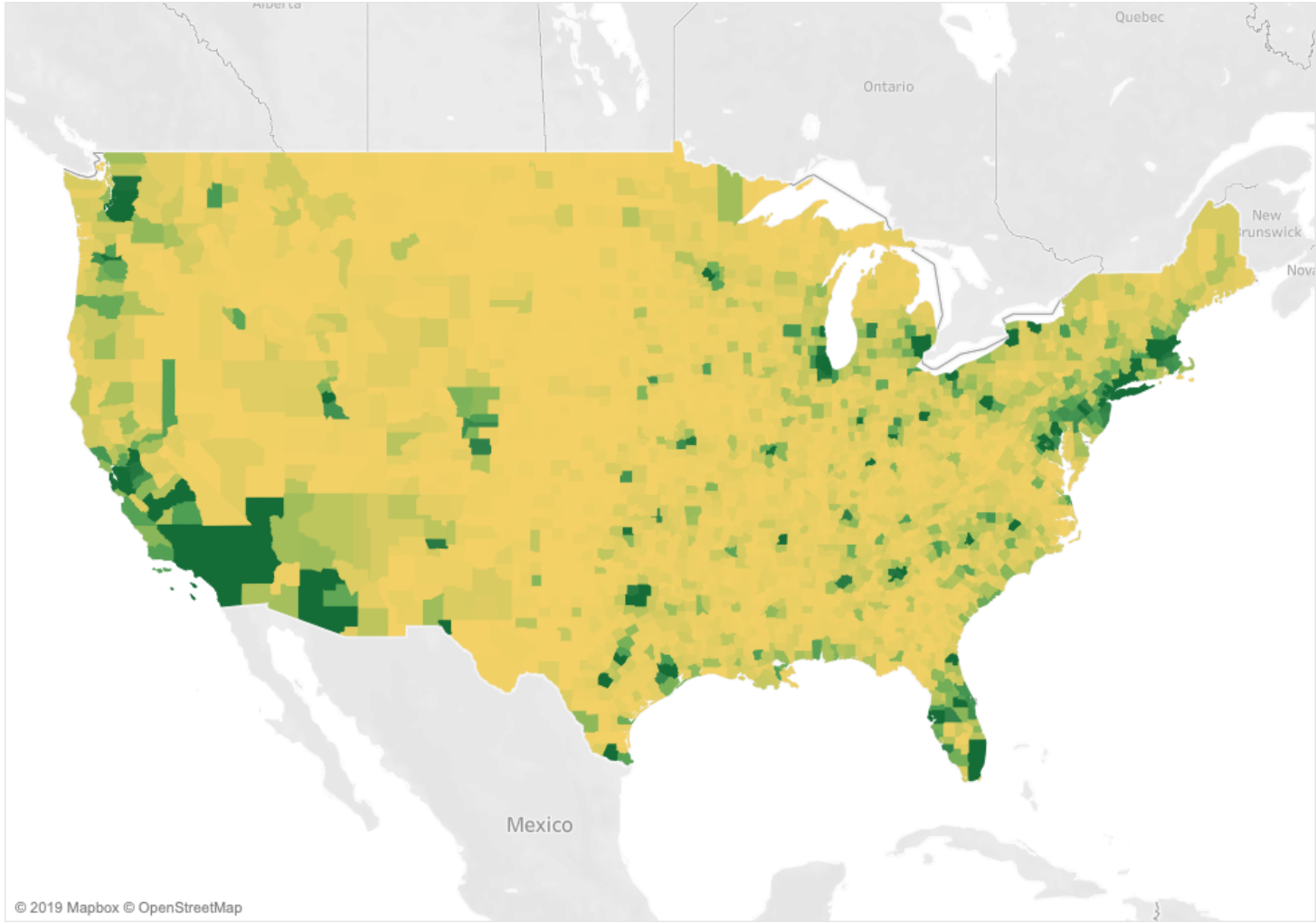


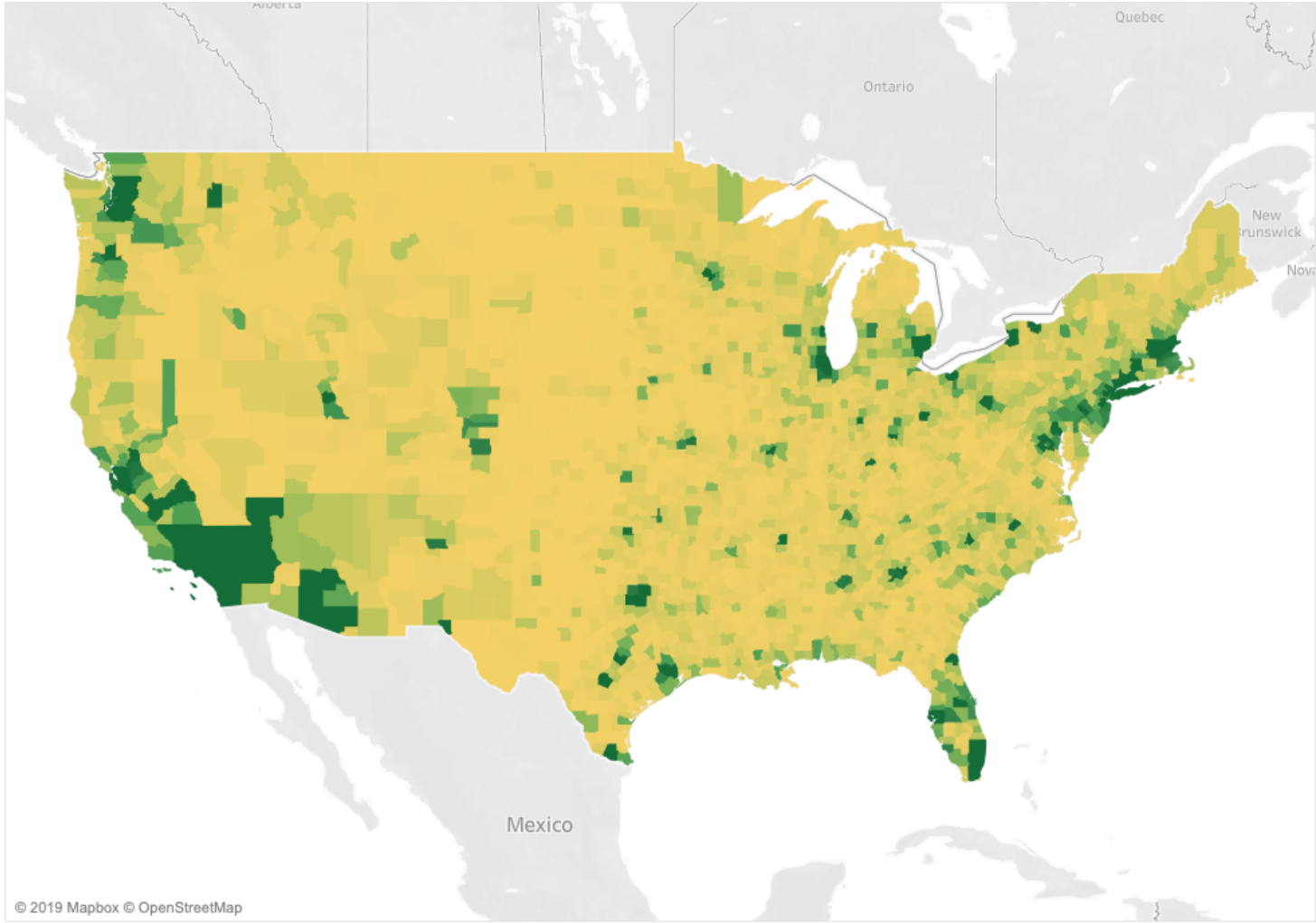




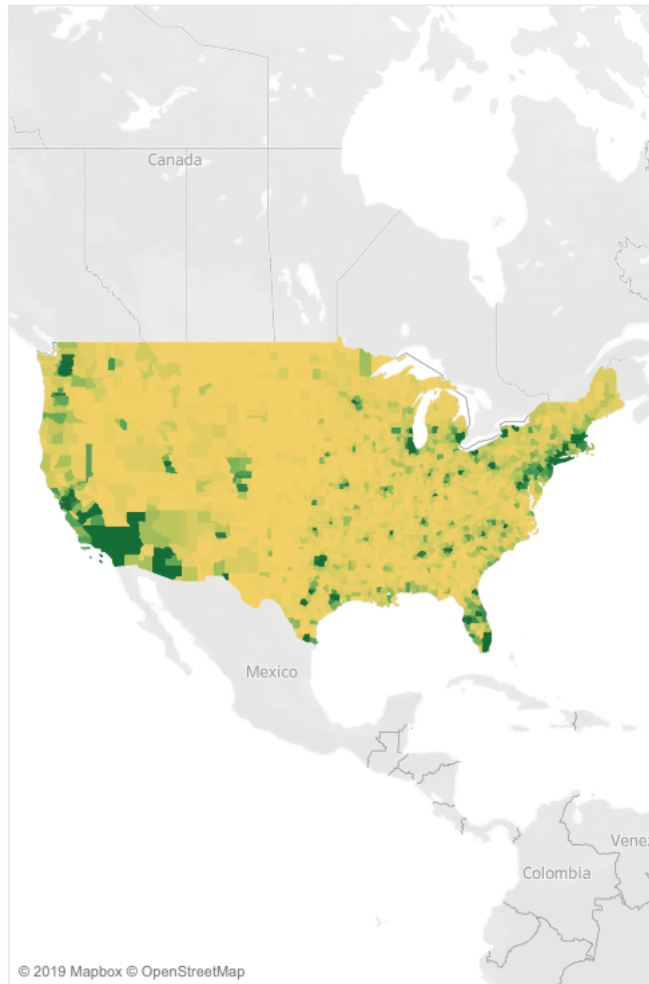




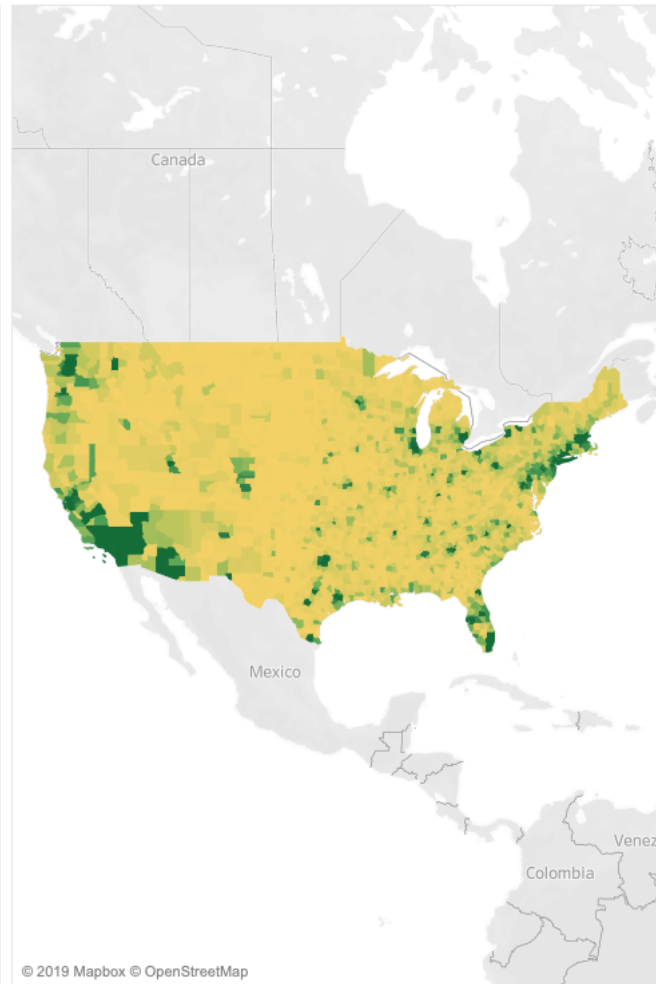


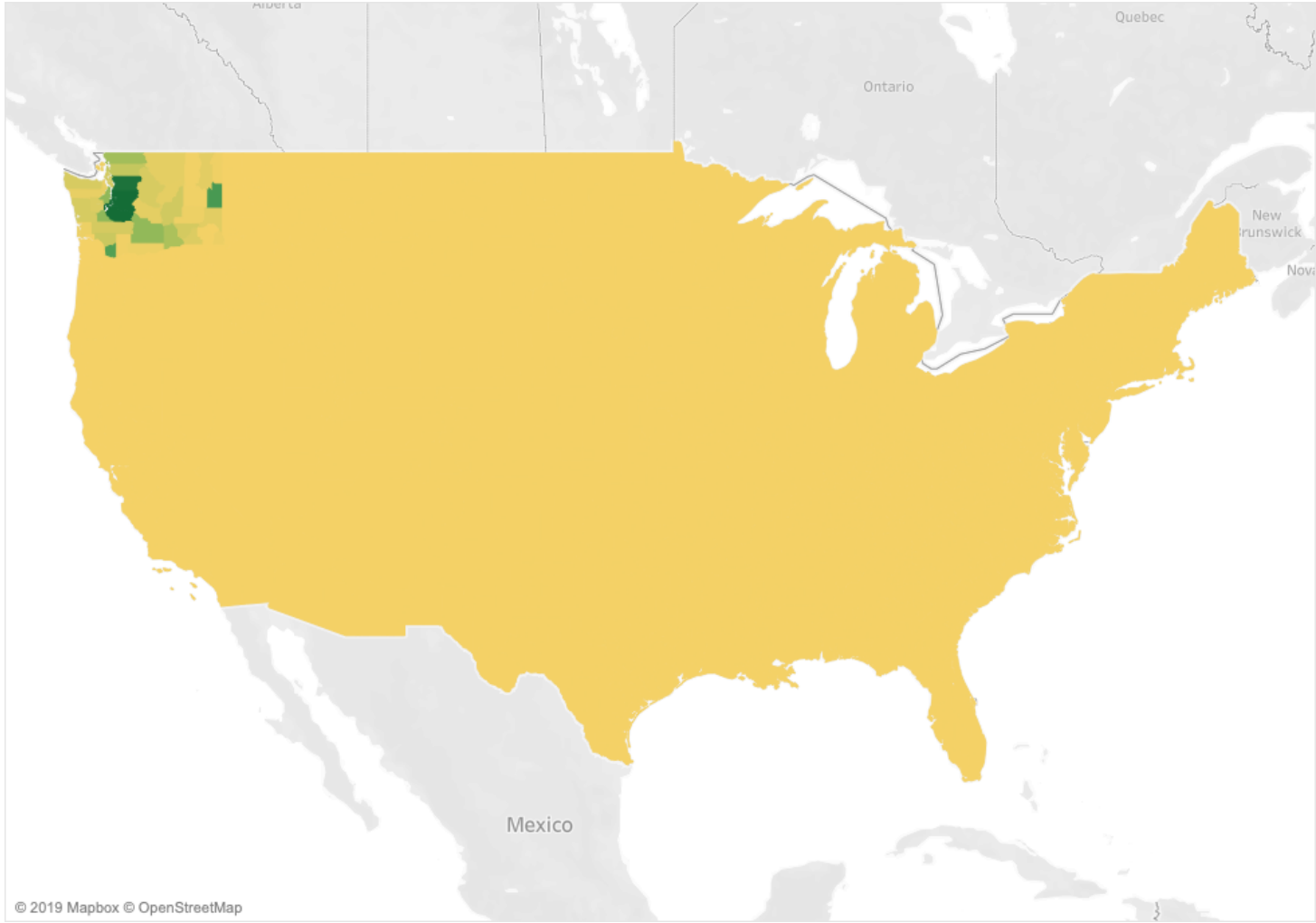


Users of A

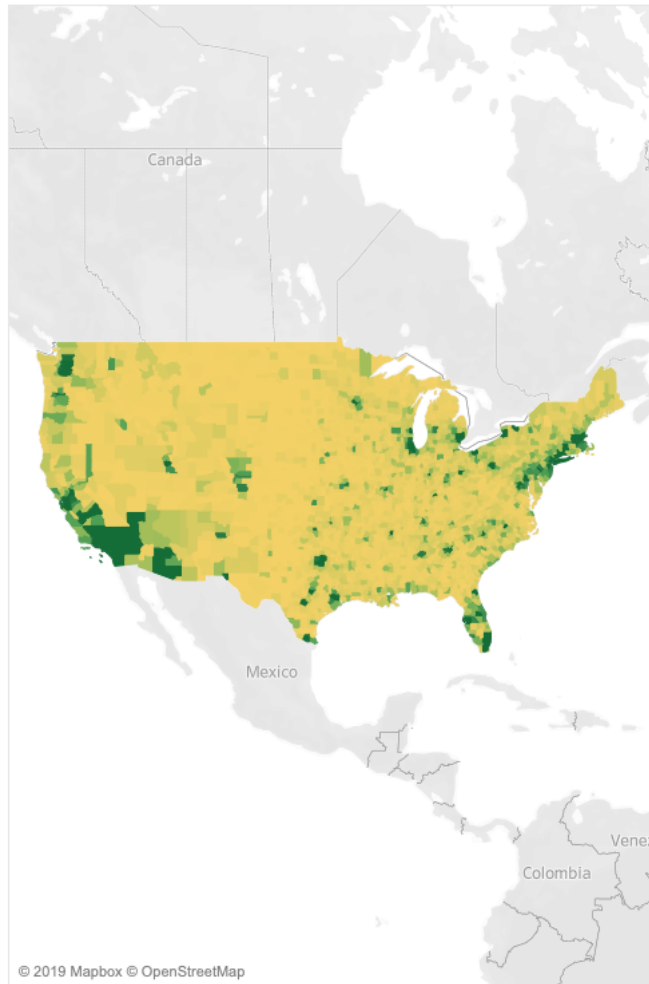


Users of B

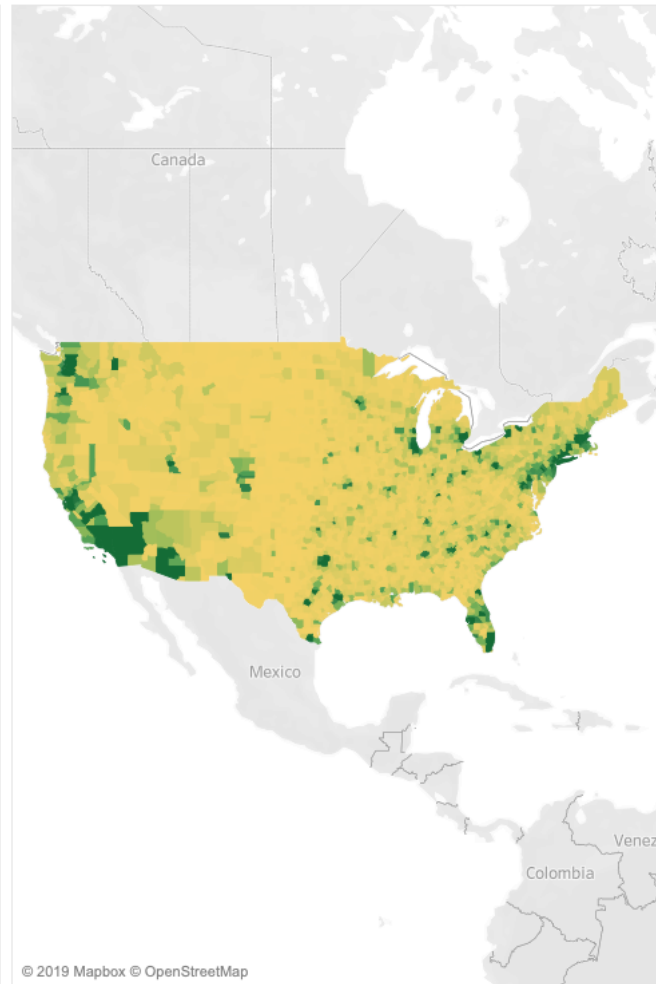




Users of A



Users of B



Metric Manipulation

Choosing how data are counted or normalized in order to hide or exaggerate effects in your data.

Wrap Up

The designer of a chart can control the **message** of the chart

There are **patterns** that can often result in misleading charts

But **critical thinking** is more important than hard rules in design

Questions

What Makes A Visualization *Deceptive*?

What Makes a Visualization *Ethical*?

Accounts of Ethics

Consequentialist Ethics

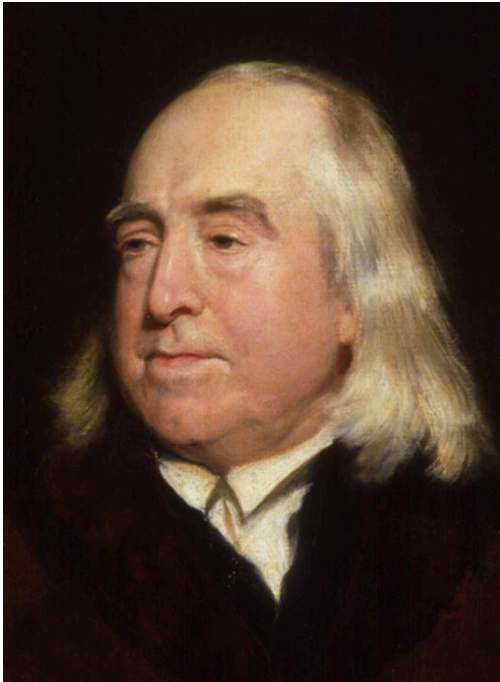
Deontological Ethics

Virtue Ethics

Role Ethics

... lots more

Consequentialism



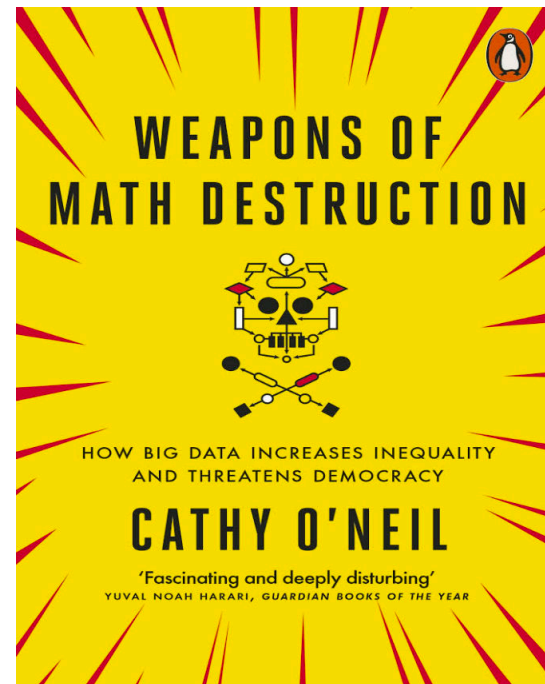
A action is ethical or unethical based on its *consequences*. For instance, in “utilitarianism,” an action’s ethics is based on *utility*.

Problems with consequentialism

What do we measure?

Who is doing the measuring?

When are we done measuring?



The Value of Visualization

- $C_i(S_0)$: *Initial development costs*. The visualization method has to be developed and implemented, possibly new hardware has to be acquired.
- $C_u(S_0)$: *Initial costs per user*. The user has to spend time on selection and acquisition of V , understanding how to use it, and tailoring it to his particular needs.
- $C_s(S_0)$: *Initial costs per session*. Data have to be converted, and an initial specification of the visualization has to be made.
- C_e : *Perception and exploration costs*. The user has to spend time to watch the visualization and understand it, as well as in modification and tuning of the specification, thereby exploring the data set.

The total costs are now given by

$$C = C_i + nC_u + nmC_s + nmkC_e.$$

The return on these investments consists of the value $W(\Delta K)$ of the acquired knowledge $\Delta K = K(T) - K(0)$ per session, multiplied by the total number of sessions:

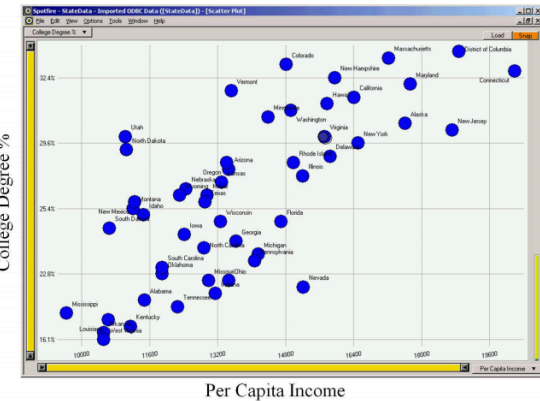
$$G = nmW(\Delta K)$$

and hence for the total profit $F = G - C$ we find

$$F = nm(W(\Delta K) - C_s - kC_e) - C_i - nC_u.$$

State	College Degree %	Per Capita Income
Alabama	20.6%	11486
Alaska	39.3%	13118
Arizona	27.1%	13461
Arkansas	17.0%	10520
California	31.3%	16493
Colorado	33.9%	14621
Connecticut	33.8%	20189
Delaware	27.9%	16884
Dist. of Columbia	36.4%	16981
Florida	24.9%	14638
Georgia	24.2%	12631
Hawaii	31.2%	19779
Idaho	25.2%	11467
Illinois	26.8%	15001
Indiana	20.9%	13149
Iowa	24.5%	14462
Kansas	25.5%	13300
Kentucky	17.7%	11153
Louisiana	19.4%	10939
Maine	25.7%	12997
Maryland	31.7%	17738
Massachusetts	34.5%	17224
Michigan	24.1%	14154
Minnesota	30.4%	14399
Mississippi	19.9%	9648
Missouri	22.2%	12999
Montana	25.4%	11213
Nebraska	26.0%	12462
Nevada	21.5%	15214
New Hampshire	32.4%	15999
New Jersey	30.1%	16714
New Mexico	25.5%	11246
New York	29.6%	16501
North Carolina	24.4%	12089
North Dakota	28.1%	11051
Ohio	22.2%	13461
Oklahoma	22.8%	11893
Oregon	27.5%	13418
Pennsylvania	23.2%	14068
Rhode Island	27.5%	14981
South Carolina	21.0%	11997
South Dakota	24.6%	10861
Tennessee	20.1%	12255
Texas	25.5%	12984
Utah	30.0%	11029
Vermont	31.5%	12527
Virginia	30.0%	15713
Washington	30.9%	14621
West Virginia	16.1%	10520
Wisconsin	24.9%	13278
Wyoming	26.7%	12311

(a) A thousand words

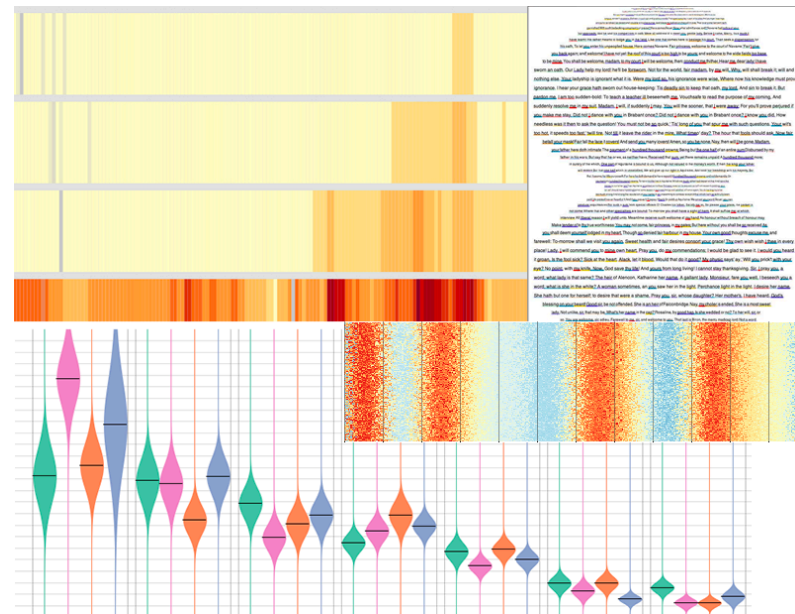


(b) A picture

Fig. 1: "A picture is worth a thousand words"

The Value of Visualization

Player in Year	Full Name	Number of R	All-NBA Stats	Assist To Tur	Fg Percentage
1 Charles Barkley_1988	Charles Barkley	1	All-NBA First	1.27952756	0.5794702
2 Earvin Johnson_1988	Earvin Johnson	1	All-NBA First	3.16666667	0.50923483
3 Michael Jordan_1988	Michael Jordan	4	All-NBA First	2.24137931	0.53816156
4 Karl Malone_1988	Karl Malone	1	All-NBA First	0.76842105	0.51892239
5 Hakeem Olajuwon_1988	Hakeem Olajuwon	1	All-NBA First	0.54181818	0.50771208
6 Charles Barkley_1989	Charles Barkley	1	All-NBA First	1.26337449	0.59983008
7 Patrick Ewing_1989	Patrick Ewing	1	All-NBA First	0.65467626	0.55110588
8 Earvin Johnson_1989	Earvin Johnson	1	All-NBA First	3.1384083	0.4797891
9 Michael Jordan_1989	Michael Jordan	1	All-NBA First	2.10121458	0.52647658
10 Karl Malone_1989	Karl Malone	1	All-NBA First	0.74342105	0.56177013
11 Charles Barkley_1990	Charles Barkley	1	All-NBA First	1.35238095	0.56983719
12 Earvin Johnson_1990	Earvin Johnson	1	All-NBA First	3.14968153	0.47745902
13 Michael Jordan_1990	Michael Jordan	1	All-NBA First	2.24257426	0.53892216
14 Karl Malone_1990	Karl Malone	1	All-NBA First	1.0655738	0.52674129
15 David Robinson_1990	David Robinson	1	All-NBA First	0.77037037	0.55197657
16 Clyde Drexler_1991	Clyde Drexler	1	All-NBA First	2.13333333	0.4701897
17 Michael Jordan_1991	Michael Jordan	1	All-NBA First	2.445	0.51870187
18 Karl Malone_1991	Karl Malone	1	All-NBA First	0.97177419	0.52638522
19 Christopher Mullin_1991	Christopher Mullin	1	All-NBA First	1.41584158	0.52398989
20 David Robinson_1991	David Robinson	1	All-NBA First	0.9945055	0.55121043
21 Charles Barkley_1992	Charles Barkley	1	All-NBA First	1.65236052	0.52034884
22 Michael Jordan_1992	Michael Jordan	1	All-NBA First	2.06763285	0.49525711
23 Karl Malone_1992	Karl Malone	1	All-NBA First	1.28333333	0.55232155
24 Hakeem Olajuwon_1992	Hakeem Olajuwon	1	All-NBA First	1.11068702	0.52900811
25 William Price_1992	William Price	1	All-NBA First	3.07142857	0.48377282
26 Karl Malone_1993	Karl Malone	1	All-NBA First	1.4017094	0.49742268
27 Hakeem Olajuwon_1993	Hakeem Olajuwon	1	All-NBA First	1.05904059	0.52774498
28 Scottie Pippen_1993	Scottie Pippen	1	All-NBA First	1.73706897	0.49061033
29 Latrell Sprewell_1993	Latrell Sprewell	1	All-NBA First	1.70353982	0.43260409
30 John Stockton_1993	John Stockton	1	All-NBA First	3.87593985	0.52764977
31 Anfernee Hardaway_1994	Anfernee Hardaway	1	All-NBA First	2.13565892	0.51225919



Deontological Ethics



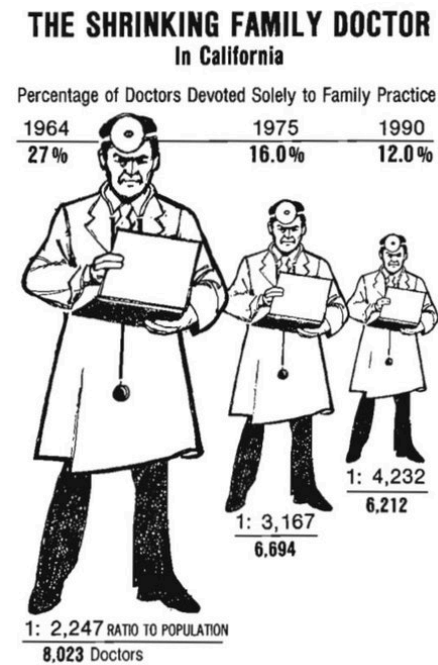
An action is ethical or unethical based on whether or not it follows the *rules*.

Visualization “Rules”

Tufte’s Lie Factor

LF = size of effect shown in graphic
/ size of effect in data

”Dishonest” if $LF \neq 1$



Visualization “Rules”

Tufte’s Lie Factor

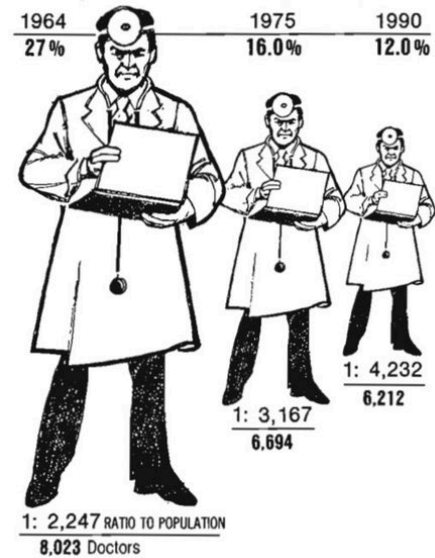
LF = size of effect shown in graphic
/ size of effect in data

LF = **2.8!**

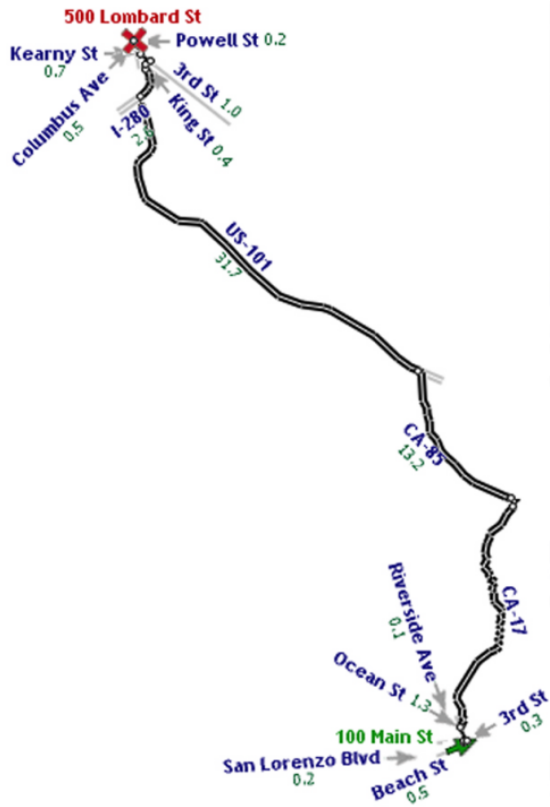
THE SHRINKING FAMILY DOCTOR In California

Percentage of Doctors Devoted Solely to Family Practice

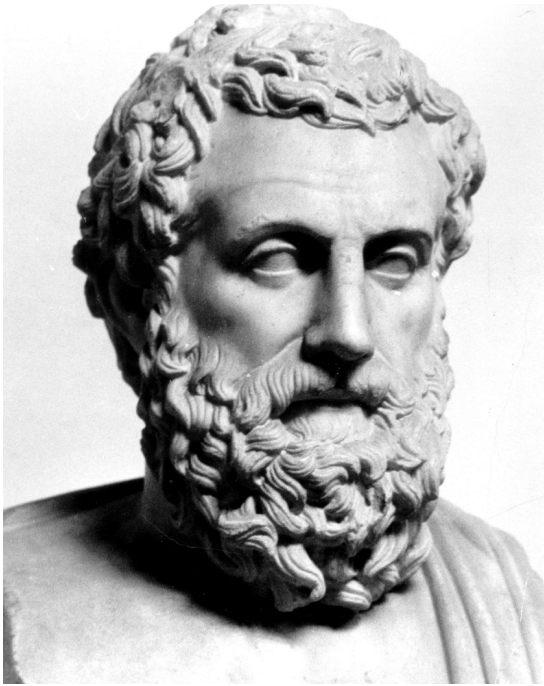
1964	1975	1990
27%	16.0%	12.0%



Visualization “White Lies”



Virtue Ethics



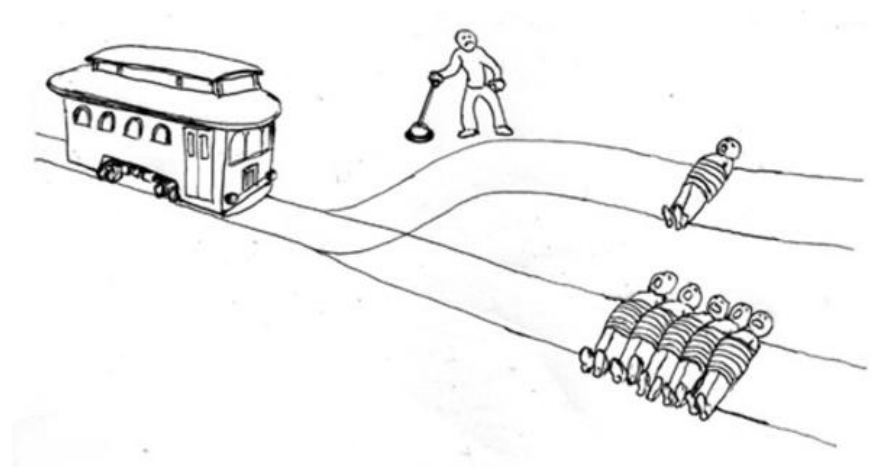
Your actions are assessed by the extent to which they *cultivate* your virtues

Problems with virtue ethics

Where do the virtues come from?

What do I do about conflicts in virtues?

What is never okay to do?



Critical InfoVis: Exploring the Politics of Visualization

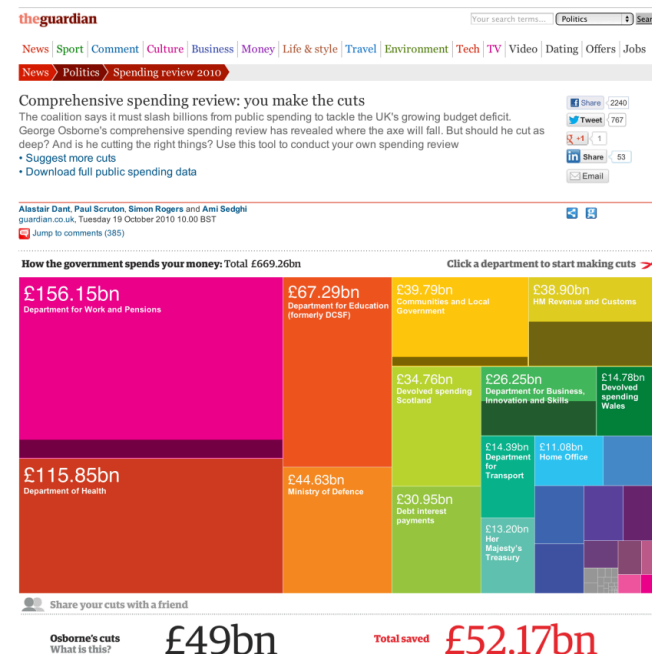
Disclosure

Plurality

Contingency

Empowerment

-Marian Dörk, Patrick Feng, Chris Collins, Sheelagh Carpendale



Role Ethics



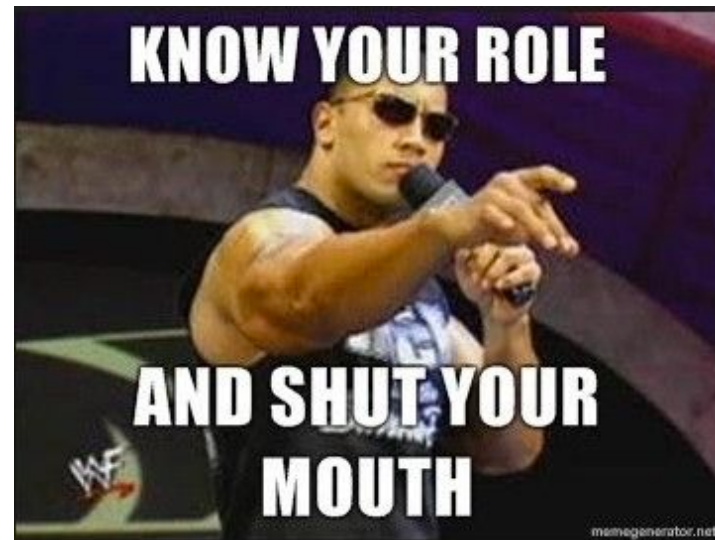
Your actions are assessed by the extent to which you *fulfill the obligations* of your role.

Problems with role-based ethics

Who gives you your roles?

What happens if you have multiple roles?

How big do our roles get?



Professional Ethics

ACM CODE OF ETHICS

Computing professionals' actions **CHANGE THE WORLD**.
They should reflect upon the wider impact of their work,
consistently supporting the public good.

GENERAL ETHICAL PRINCIPLES.

Contribute to society and to human well-being, acknowledging that all people are stakeholders in computing. Avoid harm. Be honest and trustworthy. Be fair and take action not to discriminate. Respect the work required to produce new ideas, inventions, and creative works, and computing artifacts. Respect privacy. Honor confidentiality.

PROFESSIONAL RESPONSIBILITIES.

Strive to achieve high quality in both the processes and products of professional work. Maintain high standards of professional competence, conduct, and ethical practice. Know and respect existing rules pertaining to professional work. Accept and provide appropriate professional review. Give comprehensive and thorough evaluations of computer systems and their impacts, including analysis of possible risks. Perform work only in areas of competence. Foster public awareness and understanding of computing, related technologies, and their consequences. Access computing and communication resources only when authorized or when compelled by the public good. Design and implement systems that are robustly and usably secure.

PROFESSIONAL LEADERSHIP PRINCIPLES.

Ensure that the public good is the central concern during all professional computing work. Articulate, encourage acceptance of, and evaluate fulfillment of social responsibilities by members of the organization or group. Manage personnel and resources to enhance the quality of working life. Articulate, apply, and support policies and processes that reflect the principles of the Code. Create opportunities for members of the organization or group to grow as professionals. Use care when modifying or retiring systems. Recognize and take special care of systems that become integrated in the infrastructure of society.

<https://www.acm.org/code-of-ethics>



The image shows a page from the Society of Professional Journalists' Code of Ethics. The title 'Society of Professional Journalists CODE of ETHICS' is prominently displayed at the top. Below the title, the document is organized into several sections: PREAMBLE, SEEK TRUTH AND REPORT IT, ACT INDEPENDENTLY, BE ACCOUNTABLE AND TRANSPARENT, and MINIMIZE HARM. Each section contains a list of specific ethical guidelines and standards for journalists. The text is presented in a clean, professional layout with clear headings and bullet points.

Society of Professional Journalists
CODE of **ETHICS**

PREAMBLE
Members of the Society of Professional Journalists believe that public enlightenment is the foundation of justice and the foundation of democracy. Ethical journalism strives to ensure the free exchange of information that is accurate, fair and thorough. An ethical journalist acts with integrity. The Society declares these four principles as the foundation of ethical journalism and encourages their use to the greatest by all people in all media.

SEEK TRUTH AND REPORT IT
Ethical journalism should be accurate and fair. Journalists should be honest and transparent in gathering, reporting and interpreting information.
Journalists should:

- Take responsibility for the accuracy of their work. Verify information before releasing it. Use the original source whenever possible.
- Remember that neither speed nor format excuses inaccuracy.
- Provide context. Take special care not to misrepresent or oversimplify in printing, presenting or summarizing a story.
- Be fair, quote and correct information throughout the life of a news story.
- Be cautious when making promises, but keep the promises they make.
- Identify sources clearly. The public is entitled to as much information as possible to judge the reliability and motivations of sources.
- Consider sources' motives before promising anonymity. Reserve anonymity for sources who may face danger, retribution or other harm, and have information that cannot be obtained otherwise. Explain why anonymity was granted.
- Discourage weak sources of news coverage to allow them to request to criticize or allegations of wrongdoing.
- Avoid undercover or other surreptitious methods of gathering information unless traditional, open methods will not yield information vital to the public. Use covert and undercover methods only when necessary.
- Be alert and courageous about holding those with power accountable. One voice is the weakest.
- Support the open and civil exchange of views, even views they find repugnant.
- Uphold a special obligation to serve as watchdogs over public affairs and government. Seek to ensure that the public's business is conducted in the open, and that public records are open to all.
- Provide access to source material when it is relevant and appropriate.
- Boldly tell the story of the diversity and magnitude of the human experience. Seek sources whose voices we seldom hear.
- Avoid sensationalism. Journalists should examine the ways their values and experiences may shape their reporting.
- Label advocacy and commentary.
- Never deliberately distort facts or context, including visual information. Clearly label illustrations and reconstructions.
- Never plagiarize. Always attribute.

MINIMIZE HARM
Ethical journalists treat sources, subjects, colleagues and members of the public as human beings deserving of respect.
Journalists should:

- Balance the public's need for information against potential harm or discomfort. Prioritize the news it has a right to know for urgency or public interest.
- Show compassion for those who may be affected by news coverage. Use heightened sensitivity when dealing with juveniles, victims of sex crimes, and sources or subjects who are incapacitated or unable to give consent. Consider cultural differences in approach and treatment.
- Recognize that legal access to information differs from an ethical justification to publish or broadcast.
- Realize that private people have a greater right to control information about themselves than public figures and others who seek power, influence or attention. Weigh the consequences of publishing or broadcasting personal information.
- Avoid pandering to lurid curiosity, even if others do.
- Balance a source's right to a fair trial with the public's right to know. Consider the implications of identifying criminal suspects before they have legal charges.
- Consider the long-term implications of the extended reach and permanence of publication. Provide context and more complete information as appropriate.

ACT INDEPENDENTLY
The highest and primary obligation of ethical journalists is to serve the public.
Journalists should:

- Avoid conflicts of interest, real or perceived. Disclose unavoidable conflicts.
- Resist gifts, favors, fees, free travel and special treatment, and avoid political and other outside activities that may compromise integrity or impartiality, or create conflicts.
- Be wary of sources offering information for favors or money; do not pay for access to news. Identify content provided by outside sources, whether paid or not.
- Deny favored treatment to advertisers, donors or any other special interests, and resist internal and external pressures to influence coverage.
- Distinguish news from advertising and other hybrids that blur the lines between the two. Disclose the deal whenever contact.

BE ACCOUNTABLE AND TRANSPARENT
Ethical journalists exercise taking responsibility for their work and explaining their decisions to the public.
Journalists should:

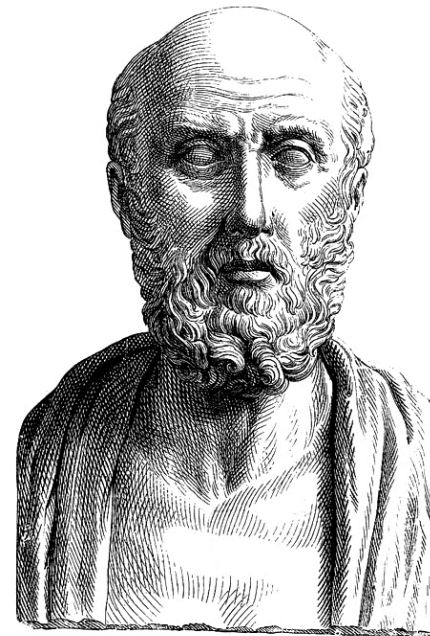
- Explain ethical choices and processes to audiences. Encourage a civil dialogue with the public about journalistic practices, coverage and news content.
- Respond quickly to questions about accuracy, clarity and fairness.
- Acknowledge mistakes and correct them promptly and transparently. Explain corrections and clarifications candidly and clearly.
- Exercise ethical contact with journalists, including within their organizations.
- Abide by the same high standards they expect of others.

The SPJ Code of Ethics is a statement of guiding principles supported by additional explanations and position papers for use and that address emerging journalistic practices. It is not a set of rules, rather a guide that encourages all who engage in journalism to take responsibility for the information they provide, regardless of medium. The code should be used as a whole; individual principles should not be taken out of context. It is not, nor can it be under the First Amendment, legally enforceable.

Visualization Hippocratic Oath?

"I shall not use visualization to intentionally hide or confuse the truth which it is intended to portray. I will respect the great power visualization has in garnering wisdom and misleading the uninformed. I accept this responsibility willfully and without reservation, and promise to defend this oath against all enemies, both domestic and foreign."

-Jason Moore



Accounts of Ethics

Consequentialist Ethics

Deontological Ethics

Virtue Ethics

Role Based Ethics

... lots more

What's a "Good" Visualization?

One that has the most *benefits* for the least *cost*

One that follows the *rules of good design*

One that *cultivates* the right *virtues*

One that *fulfills* our *duties* as visualization designers

Berkeley/Haas Ethics Questions

Would I be happy for this decision to be on the public record?

What would happen if everybody did this?

How would I like it if someone did this to me?

Will the proposed course of action bring about a good result?

What will the proposed course of action do to my character or the character of my organization?

Is the proposed course of action consistent with my espoused values and principles?

Topics

What does it mean to be ethical?

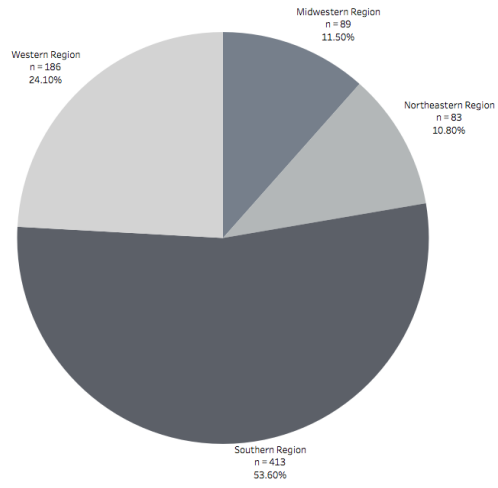
How can visualizations be unethical?

How can we make visualizations more ethical?

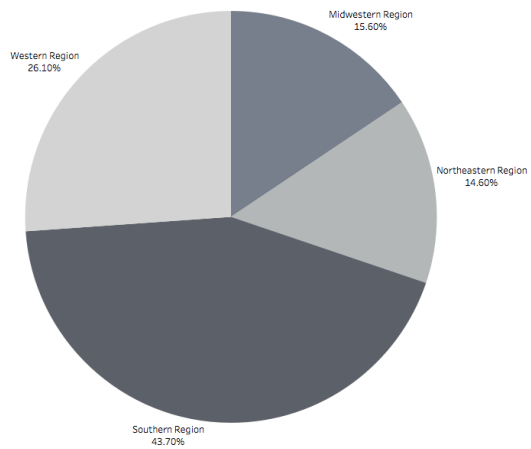
While it may seem like an extreme statement, I think the ideology of almost all current information visualization is anathema to humanistic thought, antipathetic to its aims and values. The persuasive and seductive rhetorical force of visualization performs such a powerful reification of information that graphics such as Google Maps are taken to be simply a presentation of “what is,” as if all critical thought had been precipitously and completely jettisoned.

Johanna Drucker, “Humanistic theory and digital scholarship”

Logging fatalities and percentages by region, 1992-97

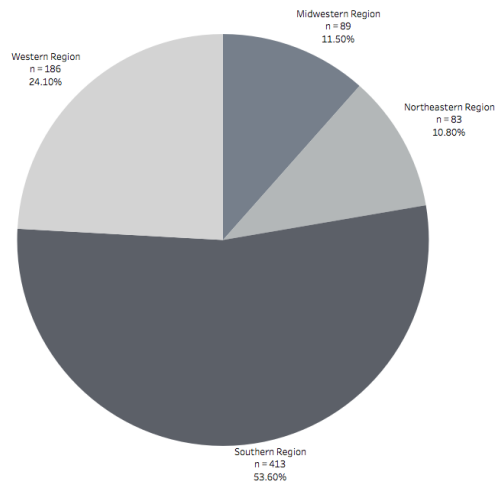


Logging employment percentages by region, 1992-97

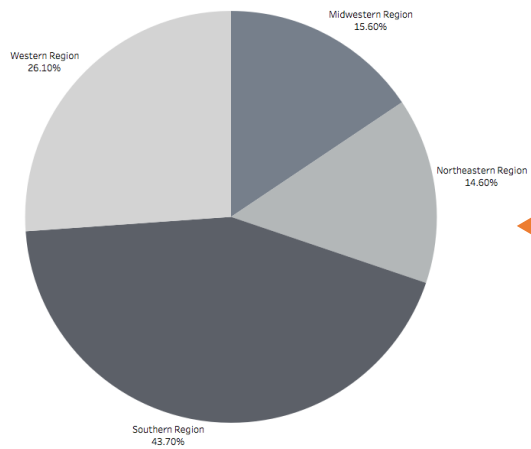


Sam Dragga & Dan Voss “Cruel Pies: The Inhumanity of Technical Illustrations”

Logging fatalities and percentages by region, 1992-97

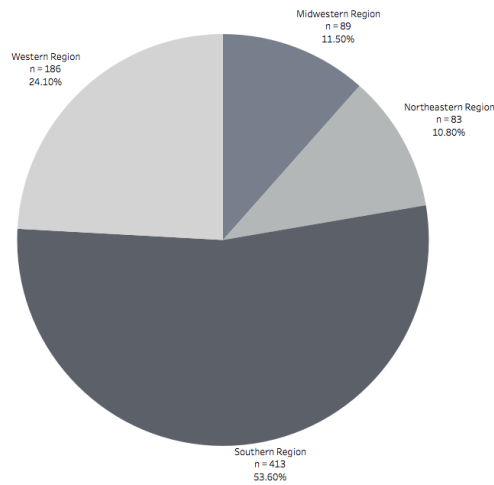


Logging employment percentages by region, 1992-97



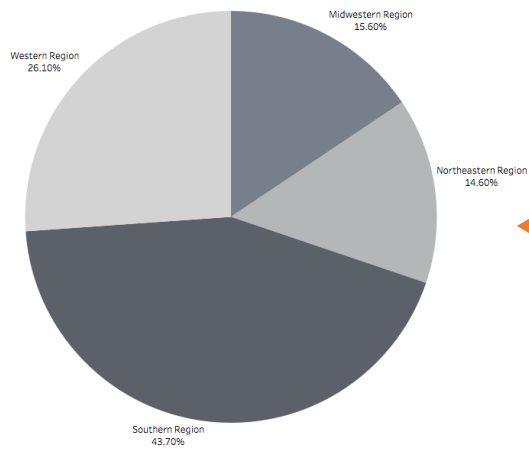
← Where Your Employees Live

Logging fatalities and percentages by region, 1992-97



← 771 Dead People

Logging employment percentages by region, 1992-97

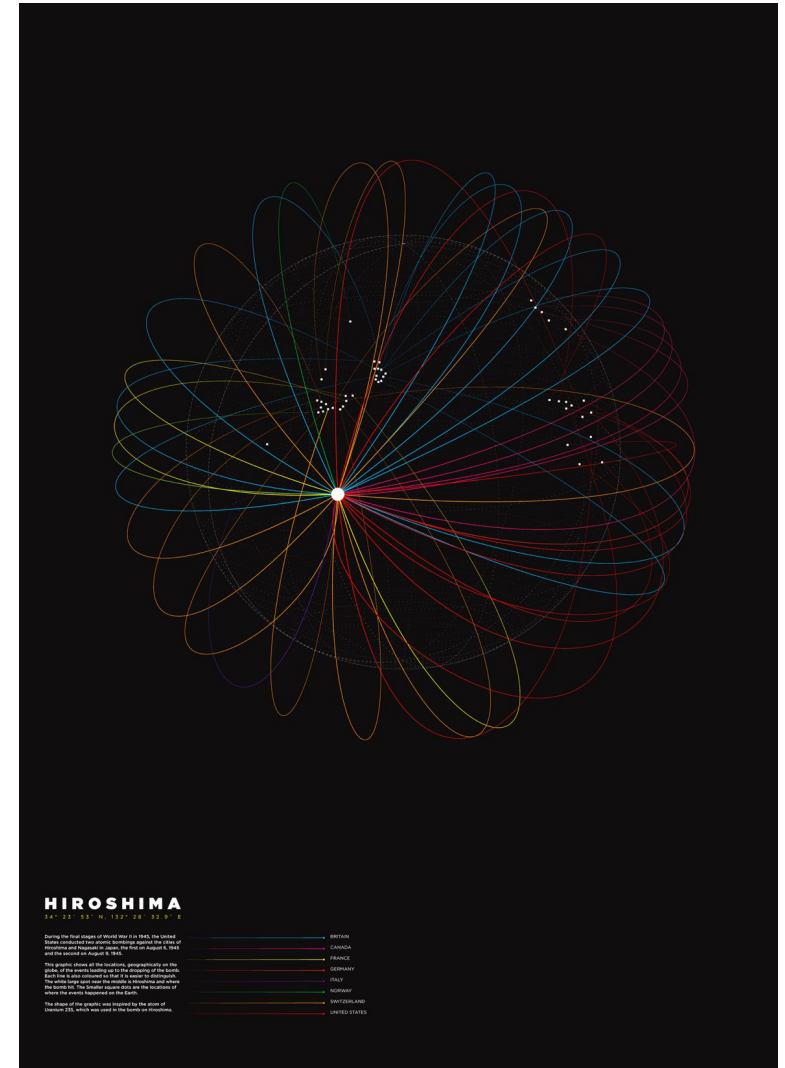


← Where Your Employees Live

“The UnEmpathic Art”

I am just very skeptical of the idea that data visualization is a medium that can convey (or even care about conveying) or increase “empathy”

-Alberto Cairo



Carte Figurative des pertes successives en hommes de l'Armée Française dans la campagne de Russie 1812-1813.

Dressée par M. Minard, Inspecteur Général des Ponts et Chaussées en retraite. Paris, le 20 Novembre 1869.

Les nombres d'hommes présents sont représentés par les largeurs des zones colorées à raison d'un millimètre pour dix mille hommes; ils sont de plus écrits en travers des zones. Le rouge désigne les hommes qui ont été en Russie, le noir ceux qui ont survécu. Les renseignements qui ont servi à dresser la carte ont été puisés dans les ouvrages de M. M. Thiers, de Ségur, de Fezensac, de Chambray et le journal inédit de Jacob, pharmacien de l'Armée depuis le 28 Octobre.

Pour mieux faire juger à l'œil la diminution de l'armée, j'ai supposé que les corps du Prince Jérôme et du Maréchal Davout qui avaient été détachés sur Minsk et Mohilow et ont rejoint vers Orscha et Witebsk, avaient toujours marché avec l'armée.

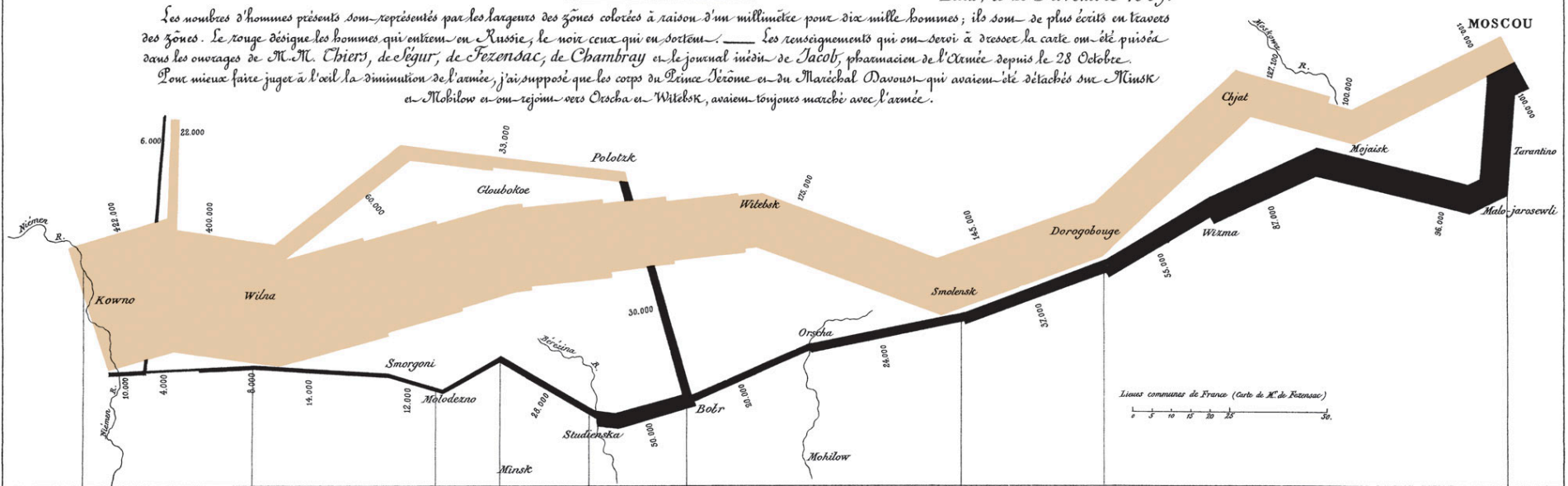
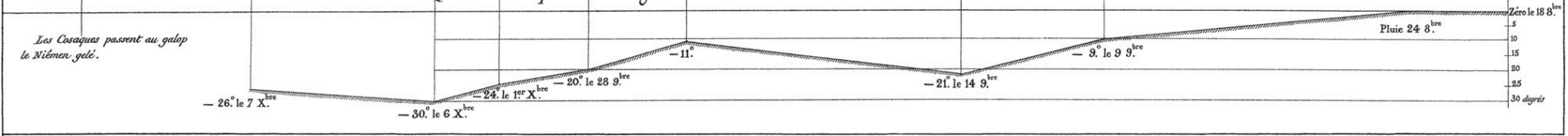


TABLEAU GRAPHIQUE de la température en degrés du thermomètre de Réaumur au dessous de zéro.



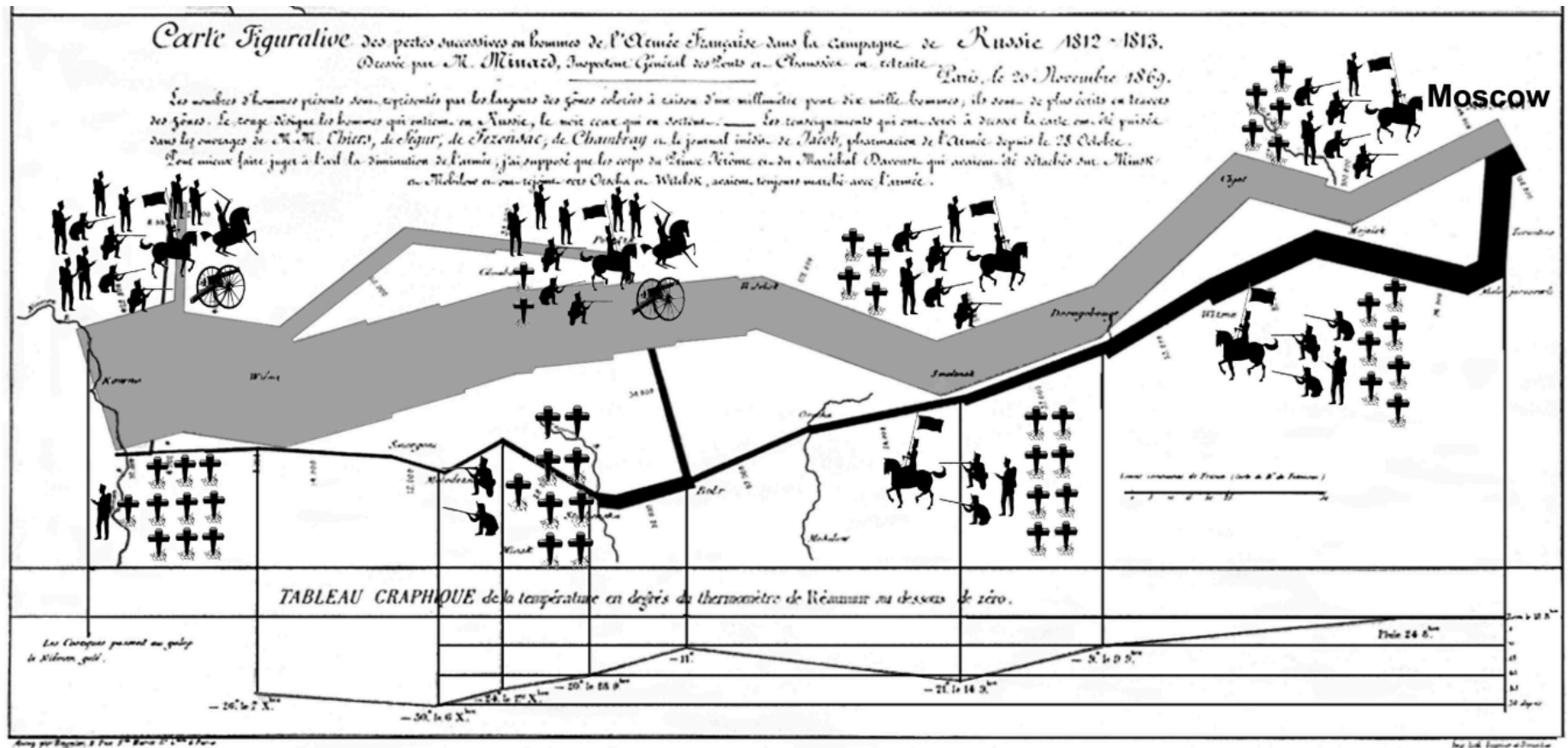


Figure 7. Pictographs could humanize Minard's depiction of Napoleon's casualties.

Carte Figurative des pertes successives en hommes de l'Armée Française dans la campagne de Russie 1812-1813.

Dressée par M. Minard, Inspecteur Général des Ponts et Chaussées en retraite. Paris, le 20 Novembre 1869.

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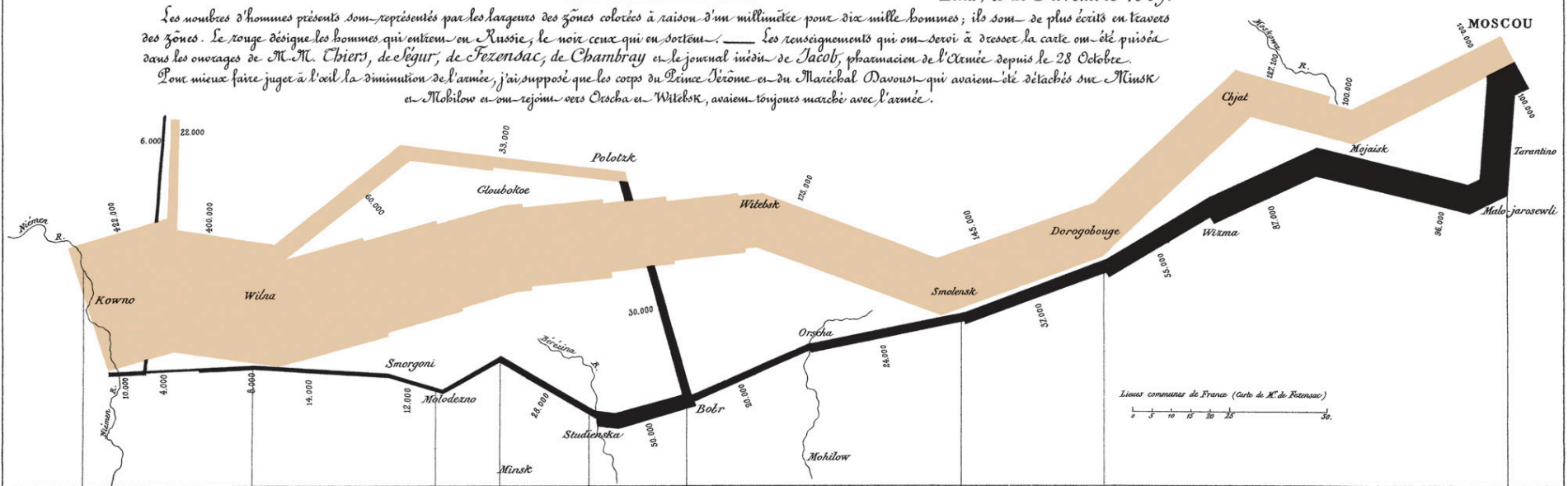
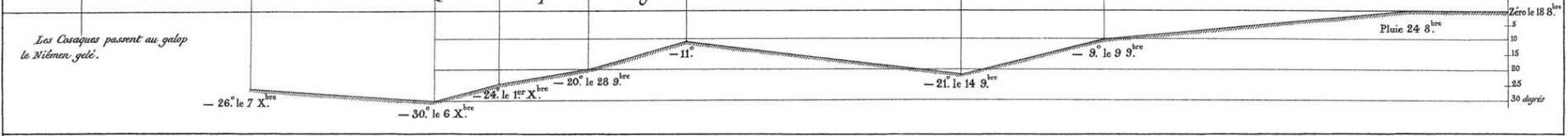


TABLEAU GRAPHIQUE de la température en degrés du thermomètre de Réaumur au dessous de zéro.



Autog. par Reynier, 8. Par. 5^{me} Marie 5^{me} O^{me} à Paris.

Imp. Lith. Regnier et Desoblet.

Carte Figurative des pertes successives en hommes de l'Armée Française dans la campagne
Décrite par M. Minard, Inspecteur Général des Ponts et Chaussées en retraite

Les nombres d'hommes présents sont représentés par les largeurs des zones colorées à raison d'un millimètre pour dix mille hommes. Le rouge désigne les hommes qui ont été en Russie, le noir ceux qui en sont restés. Les renseignements qui ont été dans les ouvrages de M. M. Thiers, de Ségur, de Fezensac, de Chambray et le journal inédit de Jacob, pharmacien. Pour mieux faire juger à l'œil la diminution de l'armée, j'ai supposé que les corps du Prince Jérôme et du Maréchal Davout et Mobilow en ont rejoint vers Orscha et Witebsk, avaient toujours marché avec l'armée.

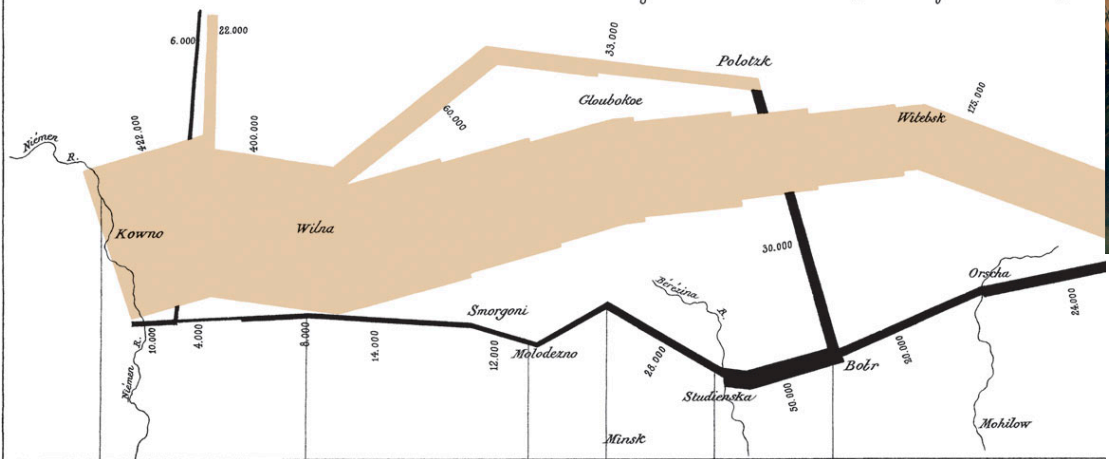
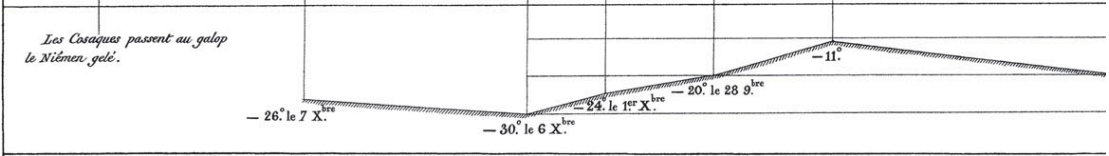


TABLEAU GRAPHIQUE de la température en degrés du thermomètre de Réaumur au de



Autog. par Reynier, à Par. 5^{me} Marie 5^{me} O^{me} à Paris.



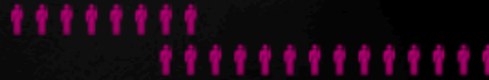
~200,000 Russian military deaths
 ~300,000-600,000 Russian civilian deaths
 ~200,000 military wounded
 UNKNOWN civilian wounded

POST
INVASION

MISC CAPTIVITY



KATYN MASSACRE



POLISH
RESISTANCE



INVASION



POLAND

THE
Fallen
OF
World War II





United Kingdom

384,000 military deaths

In September, 1944:

- Battle of Hürtgen Forest
- Operation Market Garden
- Belgrade Strategic Offensive Operation
- Finland Switched Sides
- Liberation of Belgium
- Bulgaria Switched Sides
- Gothic Line Offensive
- Invasion of Southern France
- Brittany Campaign
- Jassy-Kishinev Offensive and Romania's Surrender
- Bombing of Hamburg, Dresden, and Other Cities

Visualization's Two Big Tricks

Place things into **buckets** and count how much stuff is in each **bucket**

Abstract information into pliable forms

Hidden Buckets

People

Uncertainty

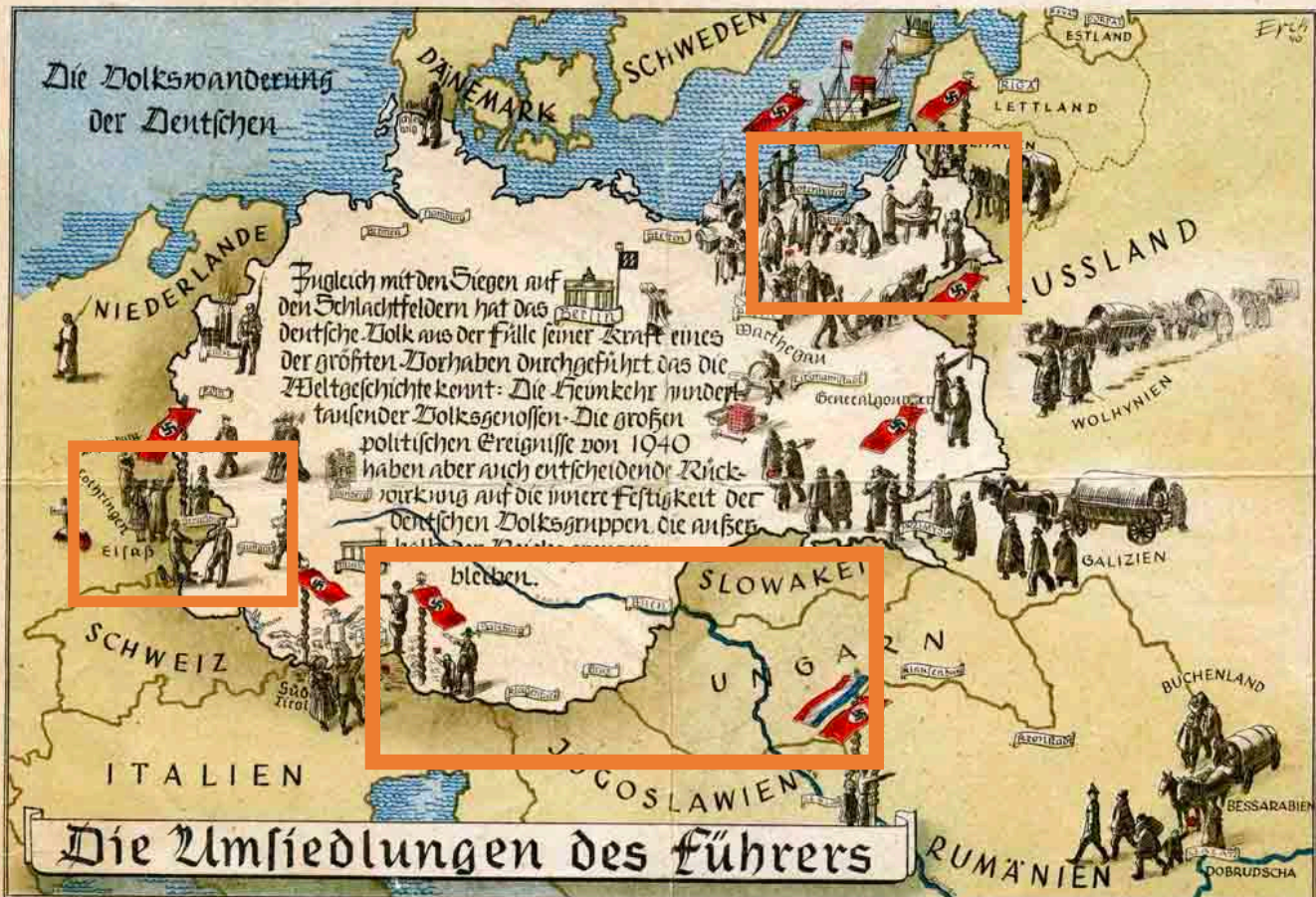
Provenance

Model Assumptions

Bias

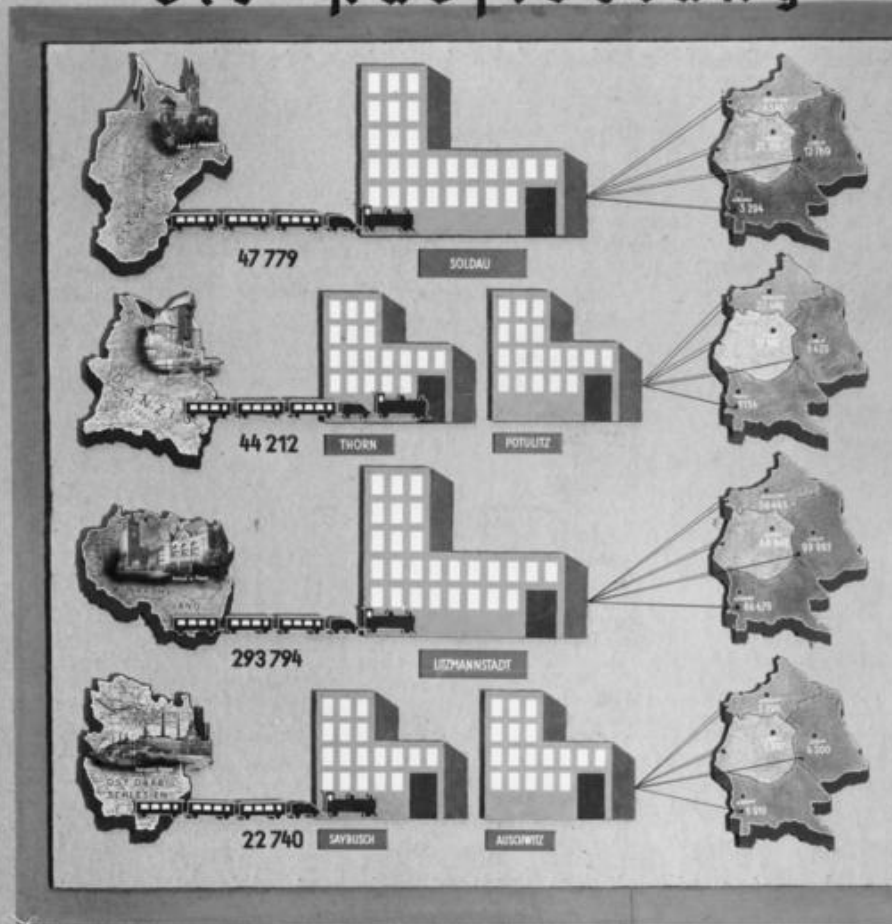


Zeichnung von Erik





Die Aussiedlung



Zur Platzschaffung - für die Ansetzung der rückgeführten Volks-deutschen werden Polen und Juden aus den eingegliederten Ostgebieten ausgesiedelt und über die Aussiedlungslager des Chefs der Sicherheitspolizei und des SD in das Generalgouvernement gefahren.

In der Zeit vom Oktober 1939 bis März 1941 wurden 408 525 Polen und Juden ausgesiedelt

In die einzelnen Distrikte wurden an Polen und Juden insgesamt ausgesiedelt:

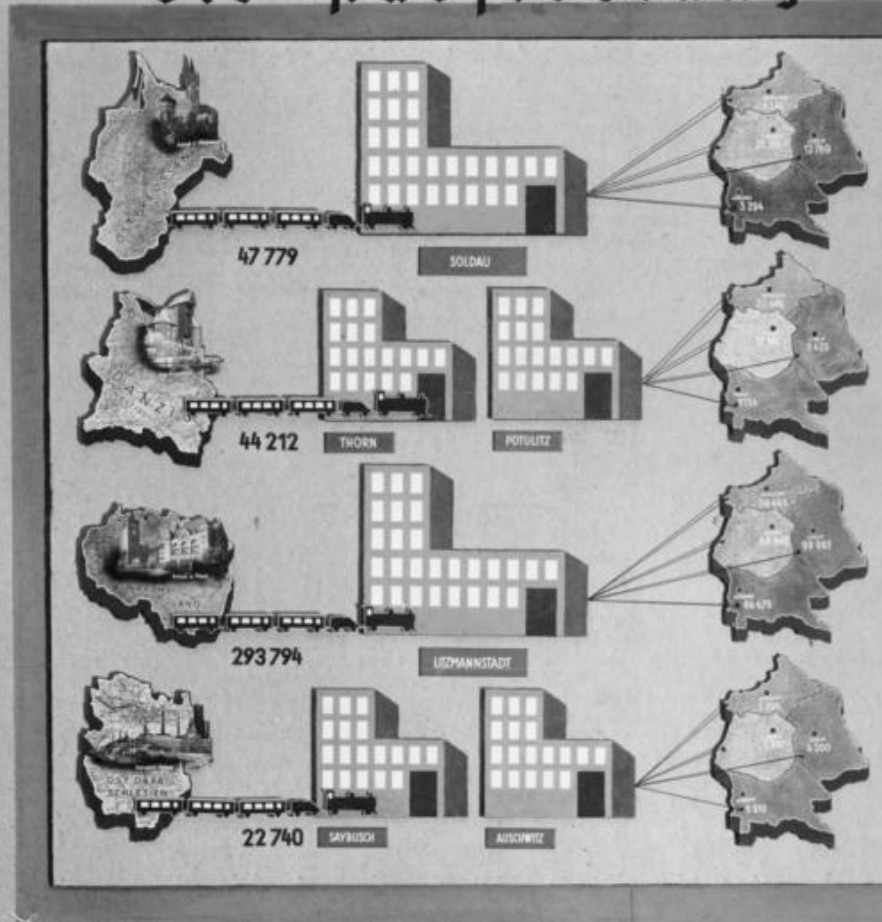
DISTRIKT WARSAU 72 850

DISTRIKT BIAŁYSTOK 111 274

DISTRIKT ŁÓDŹ 127 366

DISTRIKT KRAKÓW 97 015

Die Aussiedlung



Zur Platzschaffung - für die Ansetzung der rückgeführten Volksdeutschen werden Polen und Juden aus den eingegliederten Ostgebieten ausgesiedelt und über die Aussiedlungslager des Chefs der Sicherheitspolizei und des SD in das Generalgouvernement gefahren.

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DISTRIKT WARSAU	72 850	DISTRIKT BIAŁYSTOK	111 274	DISTRIKT LITWA	127 366	DISTRIKT UKRAINE	97 015
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Bodenständiges und rückgeführtes Bauernvolkstum in Ost und West

Die Karte zeigt den Stand der Rückführung am 1. Januar 1941. (Betrifft Litauen siehe Tabelle Seite 96/97 und Fußnote Seite 107.)

Why is our conception of “bad” visualization so narrow?

Google bad visualization

Q All Images Videos News Shopping More Settings Tools SafeSearch

data pie chart infographic good dashboard 4 dimensional data network education the functi

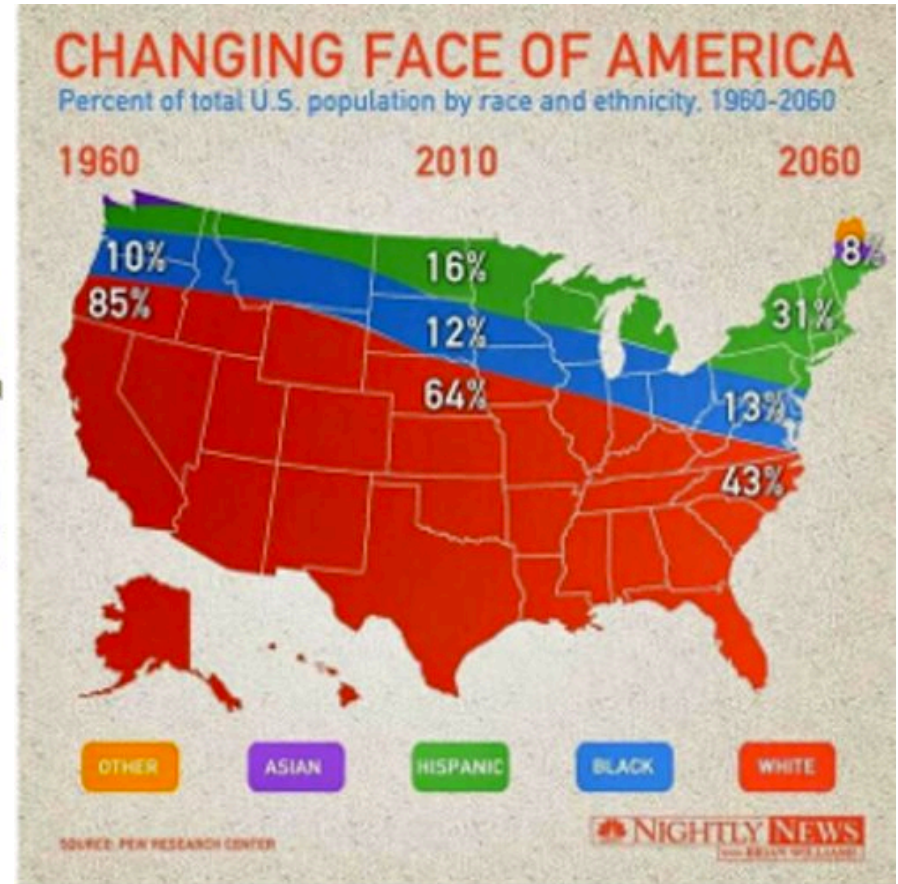
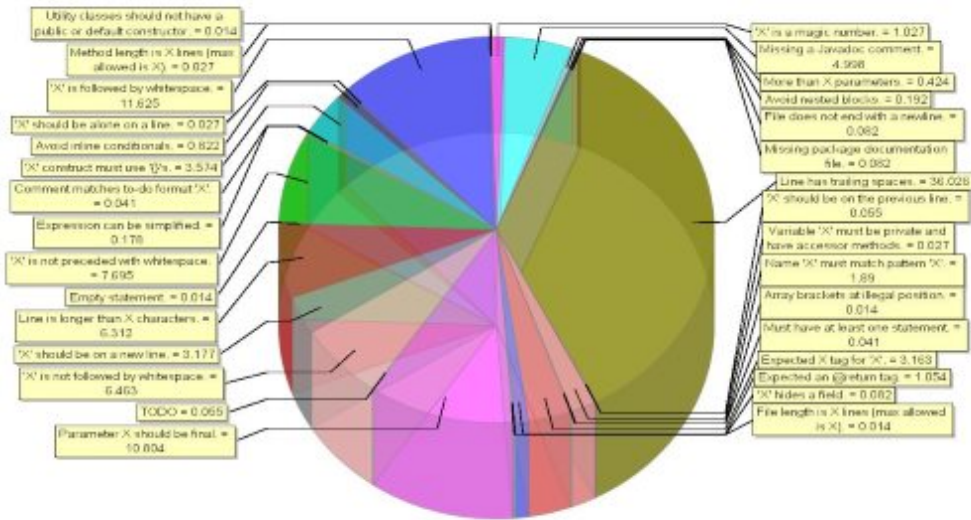
9 Worst Data Visualizations Ev...
livingqlikview.com

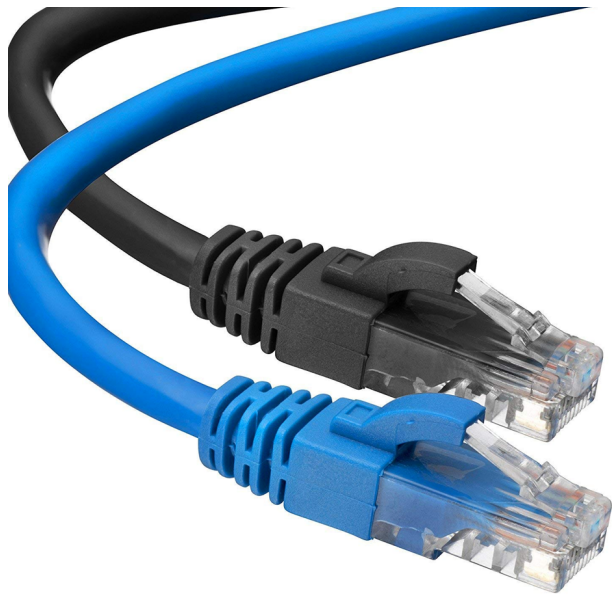
Data Stories: Avoiding Visualization...
tdwi.org

The Best and Worst Data Visualizations ...
kdnuggets.com

Pin on Chartjunk Data Visualization
pinterest.com

https://tdwi.org/articles/2018/02/28/bi-all-visualization-fails.aspx



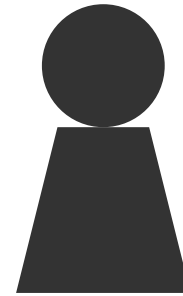
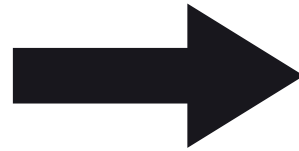


The Ethernet Delusion

“The purpose of visualization is to maximize throughput and minimize noise as you transport a dataset to a person’s brain”



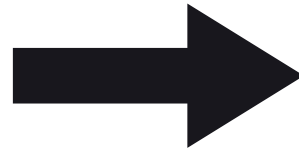
Data



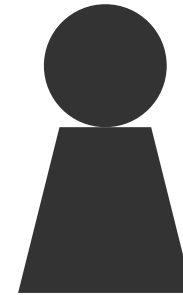
User



Data

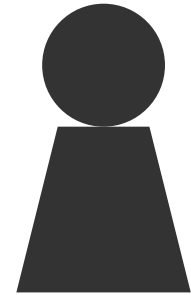
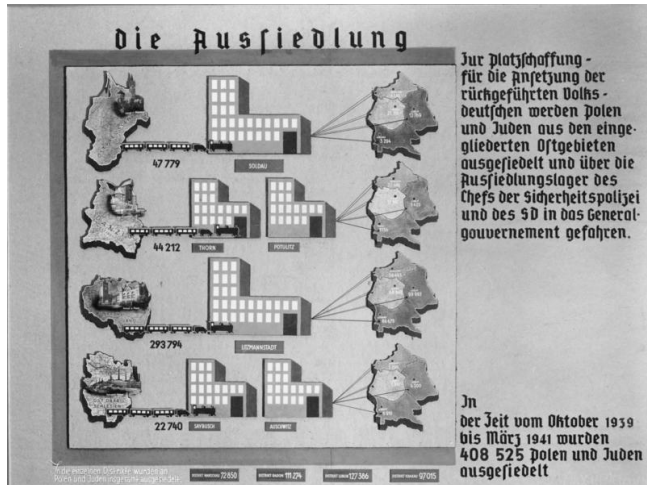


Visualization

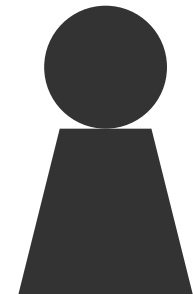
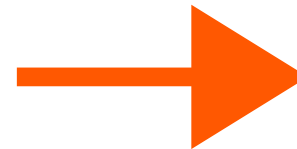
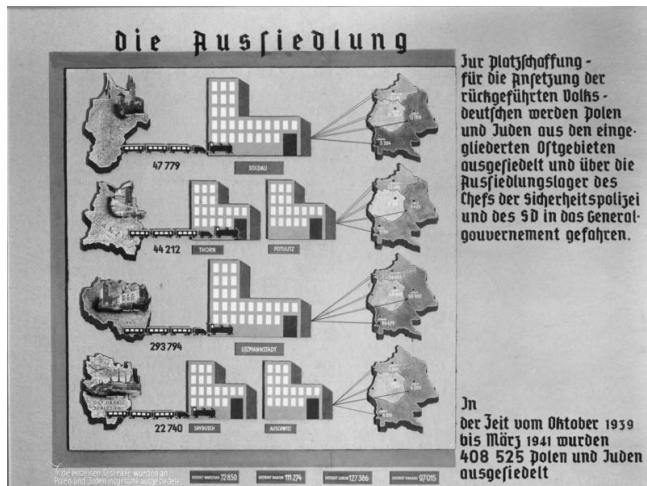


User

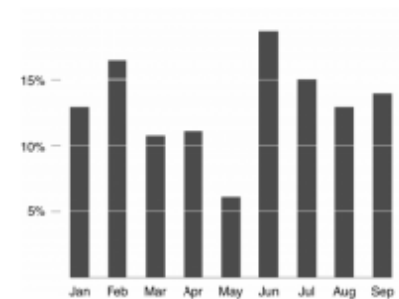
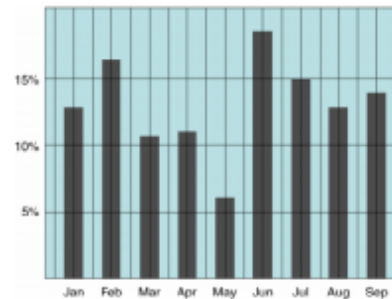
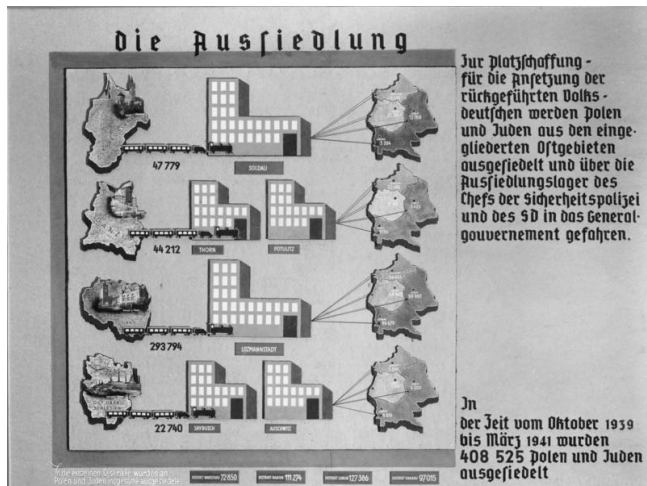
The Ethernet Delusion



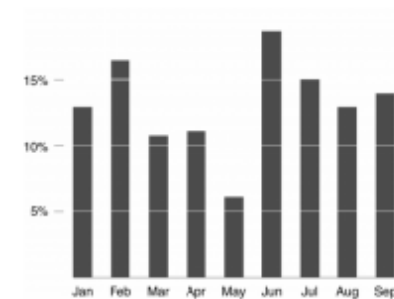
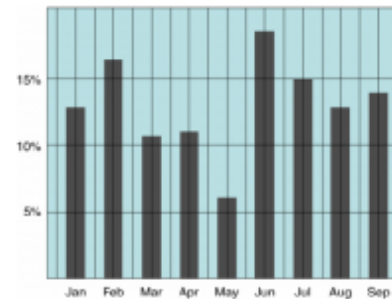
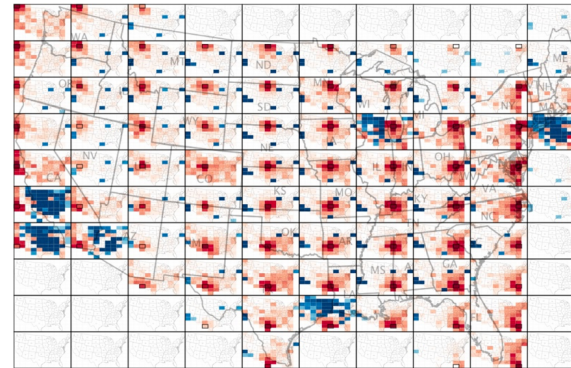
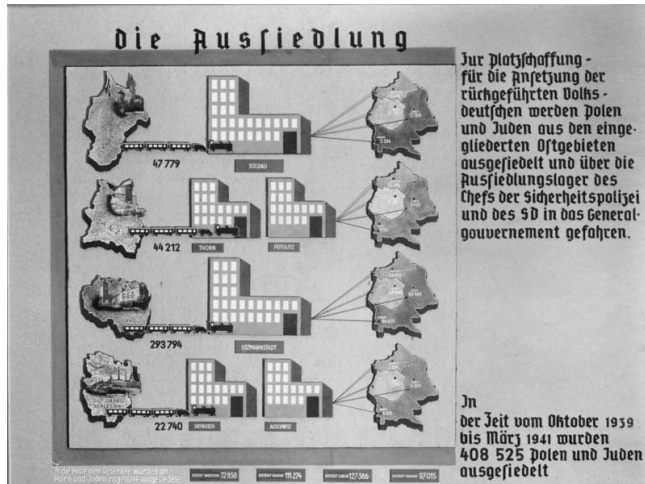
The Ethernet Delusion



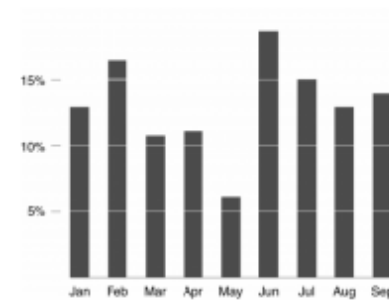
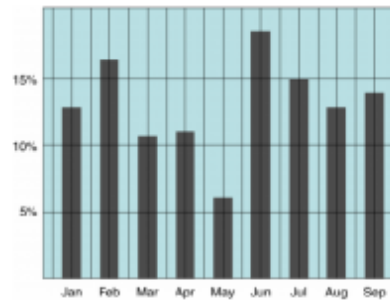
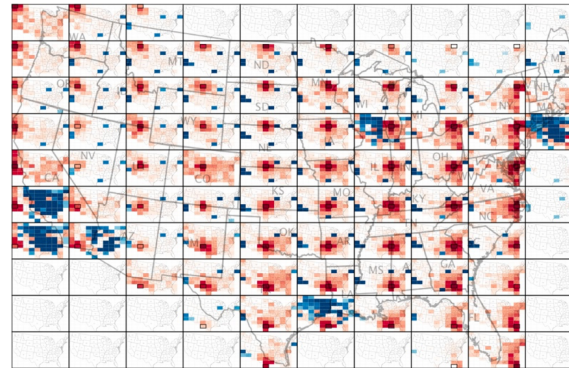
The Ethernet Delusion



The Ethernet Delusion



The Ethernet Delusion



Problems with the Ethernet Delusions

Ignores the source and rhetorical objective of visualization

Assumes data are objective truths about the world

Pre-supposes that you *must* create a visualization

Topics

What is an Ethical Visualization?

What Can Go Wrong With Visualizations?

How Can We Fix It?

Manifestos

" I SWEAR TO SUBMIT TO THE FOLLOWING SET OF RULES DRAWN UP AND CONFIRMED BY DOGME 95:

- 1 LOCATION**
FILMING MUST BE DONE ON ONE LOCATION. PROPS AND SETS MUST NOT BE BROUGHT IN FROM OUTSIDE THE LOCATION. THE LOCATION MUST BE CHOSEN WITH THE VIEW TO BE SHOWN.
- 2 NEVER (MUSIC)**
THE SOUND MUST BE PRODUCED APART FROM THE WITHIN THE SCENE IMAGES OR VICE VERSA.
- 3 THE CAMERA MUST BE A HAND-HELD CAMERA. ANY MOVEMENT OR MANIPULABILITY ATTAINABLE IN THE HAND IS PERMITTED.**
THE FILM MUST TAKE PLACE WHERE THE CAMERA IS OPERATING. FILMING MUST TAKE PLACE WHERE THE ACTION TAKES PLACE.
- 4 COLOUR. SPECIAL LIGHTING IS NOT ACCEPTABLE.**
THE FILM MUST BE IN COLOUR. SPECIAL LIGHTING IS NOT ACCEPTABLE. IF THERE IS TOO LITTLE LIGHT FOR EXPOSURE THE SCENE MUST BE CUT BY A SINGLE LAMP BE ATTACHED TO THE CAMERA.
- 5 FORBIDDEN.**
OPTICAL WORK AND FILTERS ARE FORBIDDEN.
- 6 THE FILM MUST NOT CONTAIN SUPERFICIAL ACTION. (MURDERS, WEAPONS, ETC. MUST NOT OCCUR.)**
- 7 FORBIDDEN**
TEMPORAL AND GEOGRAPHICAL ALLOCATION ARE FORBIDDEN (THAT IS TO SAY THAT THE FILM TAKES PLACE HERE AND NOW.)
- 8 GENRE MOVIES ARE NOT ACCEPTABLE.**
- 9 THE FILM FORMAT MUST BE ACADEMY 35 MM.**
- 10 THE DIRECTOR MUST NOT BE CREDITED.**

VOW OF CHASTITY

FURTHERMORE
I SWEAR AS A DIRECTOR TO REFRAIN FROM PERSONAL TASTE! I AM NO LONGER AN ARTIST. I SWEAR TO REFRAIN FROM CREATING A "WORK", AS I REGARD THE INSTANT AS MORE IMPORTANT THAN THE WHOLE. I SWEAR MY SUPREME GOAL IS TO FORCE THE TRUTH OUT OF MY CHARACTERS AND SETTINGS. I SWEAR TO DO SO BY ALL THE MEANS AVAILABLE AND AT THE COST OF ANY GOOD TASTE AND ANY AESTHETIC CONSIDERATIONS. THUS I MAKE MY VOW OF CHASTITY.

COPENHAGEN, MONDAY 12 MARCH 1995

ON BEHALF OF DOGME 95
LAAS VON TRIER THOMAS VINTERBERG

FUTURISM
F.T. Marinetti
WE INTEND TO SING THE LONE DAY OF DANGER, OF COURAGE AND OF ENERGY

COURAGE, AUDACITY, AND REVOLT WILL BE ESSENTIAL ELEMENTS OF OUR POETRY

Up to now literature has exalted a pensive immobility, ecstasy, and sleep. We intend to exalt aggressive action, a feverish insomnia, the racer's stride, the mortal leap, the punch and the slap.

We affirm that the world's magnificence has been enriched by a new beauty: the beauty of speed. A racing car whose hood is adorned with great pipes, like serpents of explosive breath—a roaring car that seems to ride on grapeshot is more beautiful than the Victory of Samothrace.

We want to hymn the man at the wheel, who hurls the lance of his spirit across the Earth, along the circle of its orbit.

The poet must spend himself with ardor, splendor, and generosity, to swell the enthusiastic fervor of the primordial elements.

Except in struggle, there is no more beauty. His work without an aggressive character can be a masterpiece. Poetry must be conceived as a violent attack on unknown forces, to reduce and prostrate them before man.

We stand on the last promontory of the centuries... Why should we look back, when what we want is to break down the mysterious doors of the impossible? Time and Space died yesterday. We already live in the absolute, because we have created eternal, omnipresent speed.

We will glorify war—the world's only hygiene—militarism, patriotism, the destructive gesture of freedom-bringers, beautiful ideas worth dying for, and scorn for women.

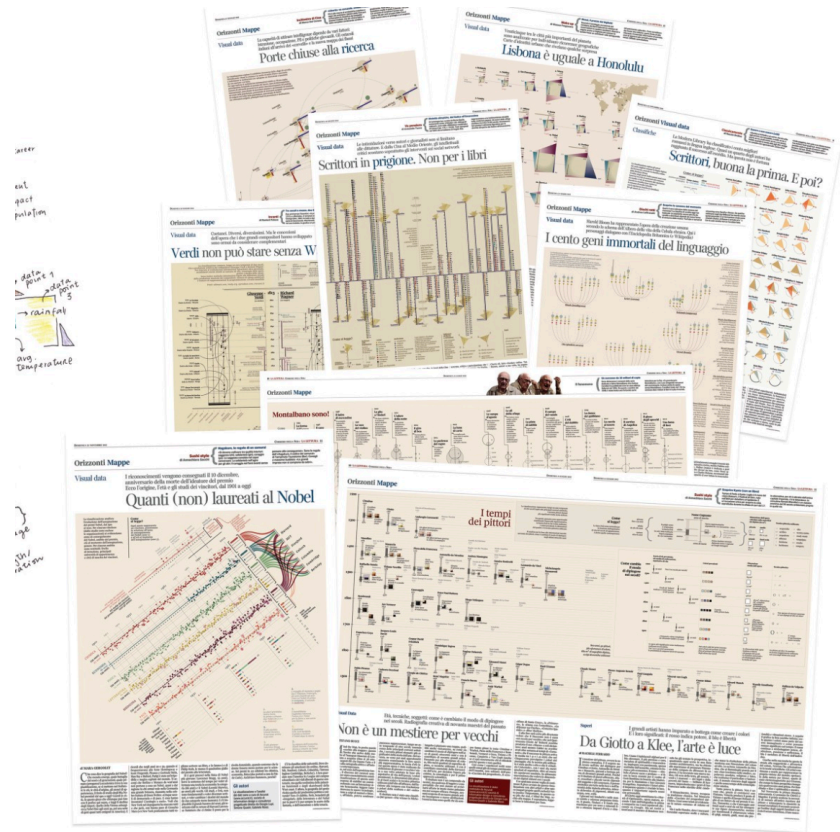
We will sing of great crowds excited by work, by pleasure, and by riot; we will sing of the multicolored, polyphonic tides of revolution in the modern capitals; we will sing of the vibrant nightly fervor of arsenals and shipyards blazing with violent electric moons; greedy railway stations that devour smoke-plumed serpents; factories hung on clouds by the crooked lines of their smoke; bridges that stride the rivers like giant gymnasts, flashing in the sun with a glitter of knives; adventurous steamers that sniff the horizon; deep-chested locomotives whose wheels paw the tracks like the hooves of enormous steel horses bridled by tubing, and the sleek flight of planes whose propellers chatter in the wind like banners and seem to cheer like an enthusiastic crowd.

WE WILL DESTROY THE MUSEUMS, LIBRARIES, ACADEMIES OF EVERY KIND, WILL FIGHT MORALISM, FEMINISM, EVERY OPPORTUNISTIC OR UTILITARIAN COWARDICE

Data Humanism

“We are ready to question the impersonality of a merely technical approach to data and to begin designing ways to connect numbers to what they really stand for: knowledge, behaviors, people.”

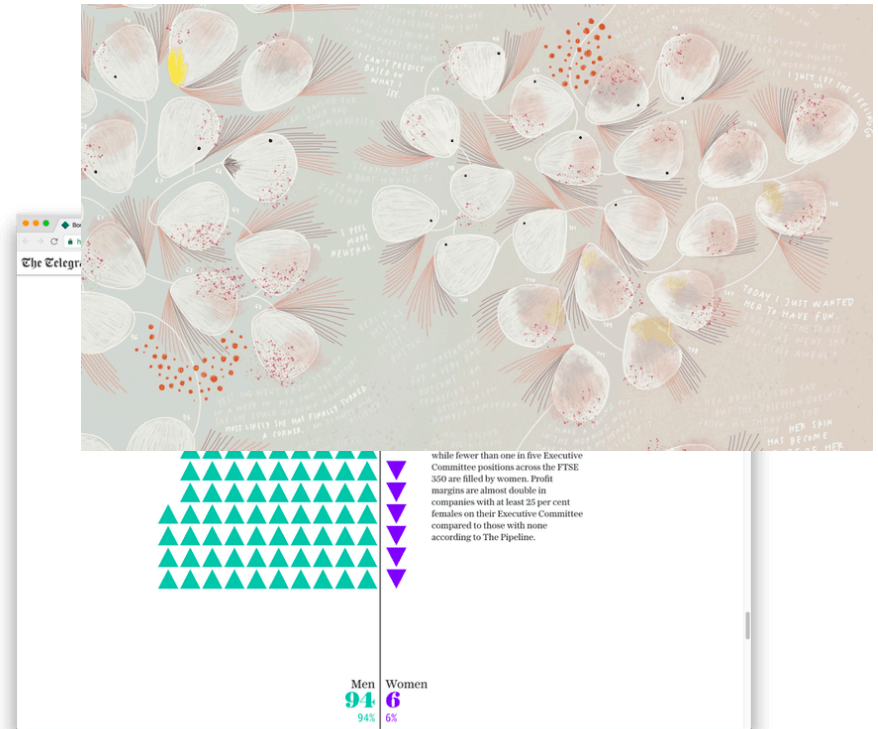
-Giorgia Lupi



Data Feminism

“We call attention to the people and their bodies who are typically included in the data collection process, as well as to the people and their bodies who are typically left out.”

-Lauren Klein and Catherine D’Ignazio

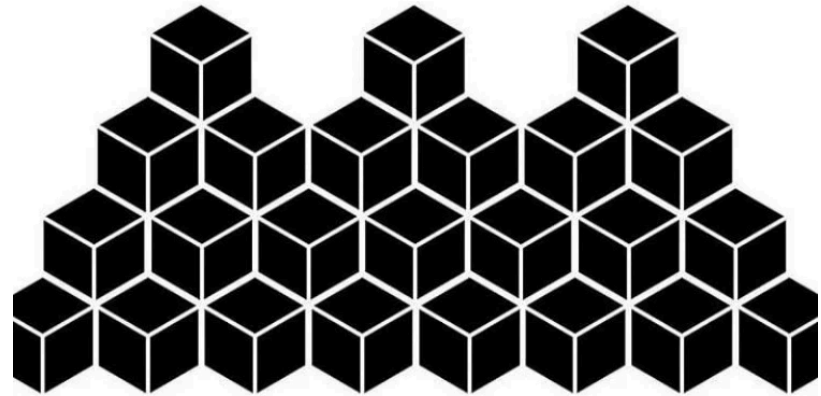


Data for Black Lives

“White supremacy is an algorithm, in and of itself... much of the work for us as data practitioners is to reverse engineer that algorithm.”

-Ejike Obineme

DATA AS PROTEST.



 DATA FOR
BLACK LIVES
CONFERENCE

Human-Computer Insurrection: Notes on an Anarchist HCI

“We must work to ensure our technologies actively contribute to (rather than detract from) human autonomy and dignity.”

-Os Keyes, Josephine Hoy, and Margaret Drouhard



Questions to Ask

Can I identify ethical and unethical data visualizations?

Can I critique the moral character of data visualizations?

Can I impact (or stop) projects I think are unethical?

Thanks!

Michael Correll

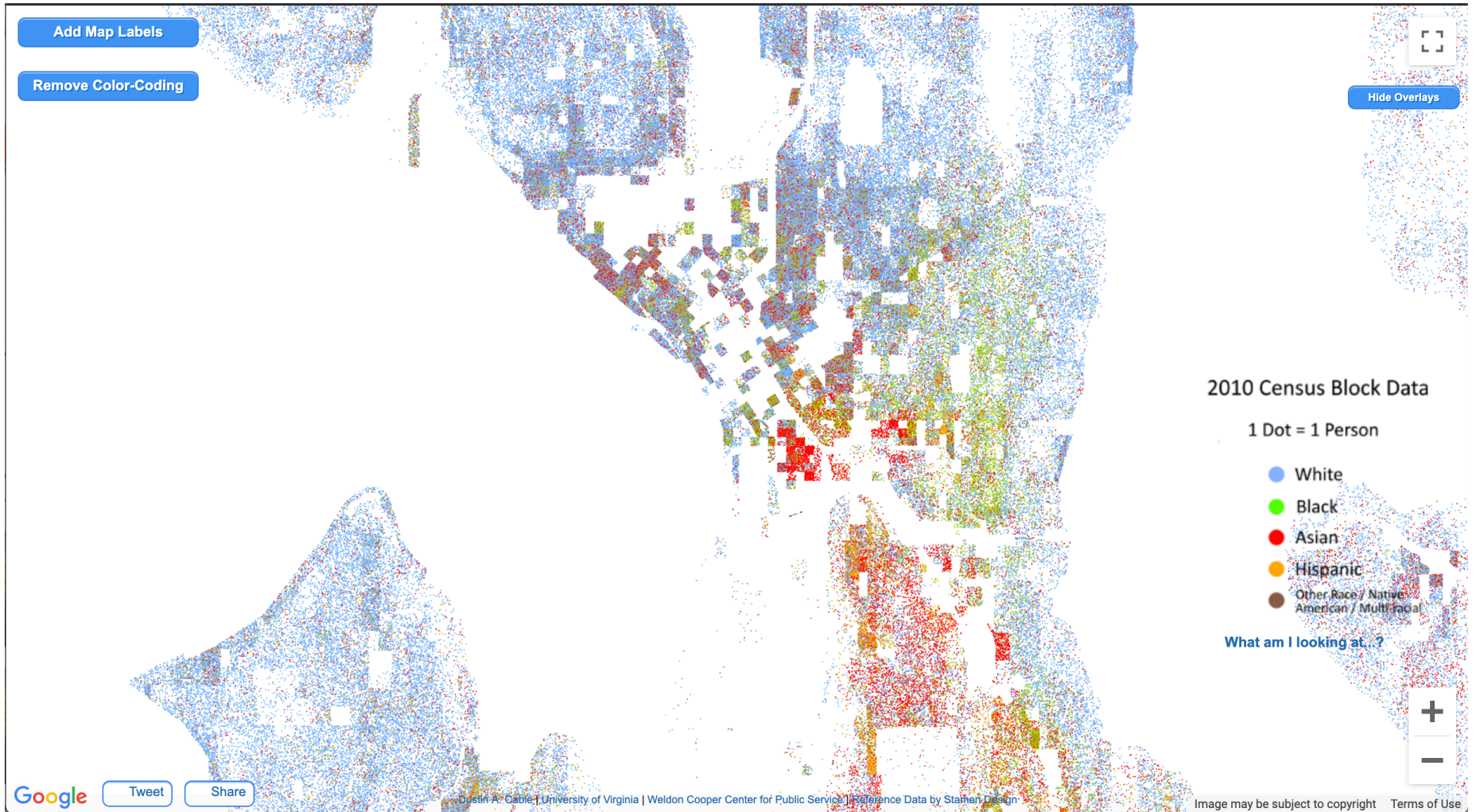
correll.io



Call Type Summary

	Crimes Against Persons	21
	Assault	8
	Robbery	5
	Threats	8
	Assisting the Public	18
	Drugs and Vice	17
	Property Crime/Theft	75
	-	100





Add Map Labels

Remove Color-Coding

Hide Overlays

2010 Census Block Data

1 Dot = 1 Person

- White
- Black
- Asian
- Hispanic
- Other Race / Native American / Multi-racial

What am I looking at...?

Google

Tweet

Share

Dustin A. Cable | University of Virginia | Weldon Cooper Center for Public Service | Reference Data by Statler Design

Image may be subject to copyright Terms of Use

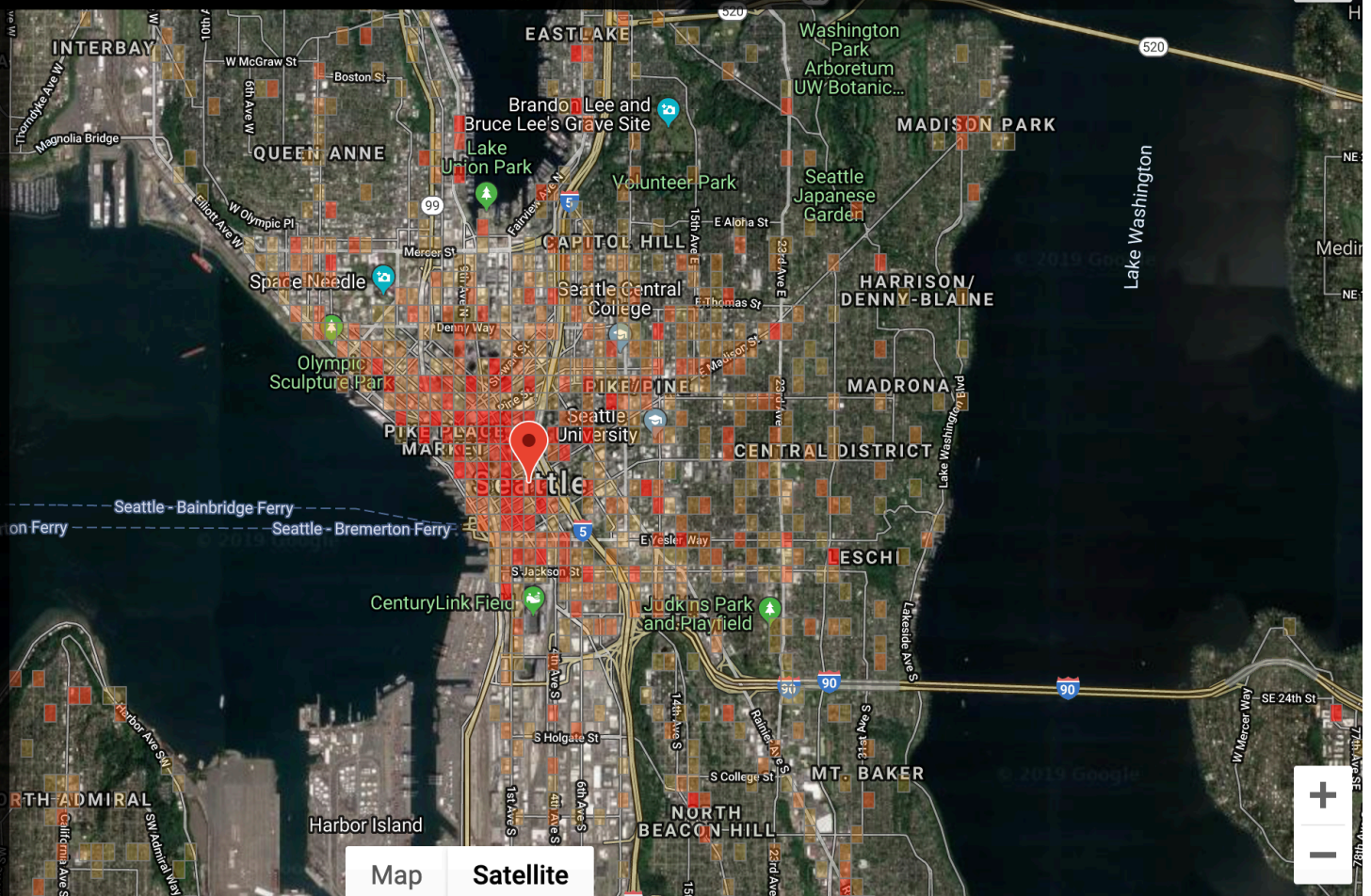
WHITE COLLAR CRIME RISK ZONES

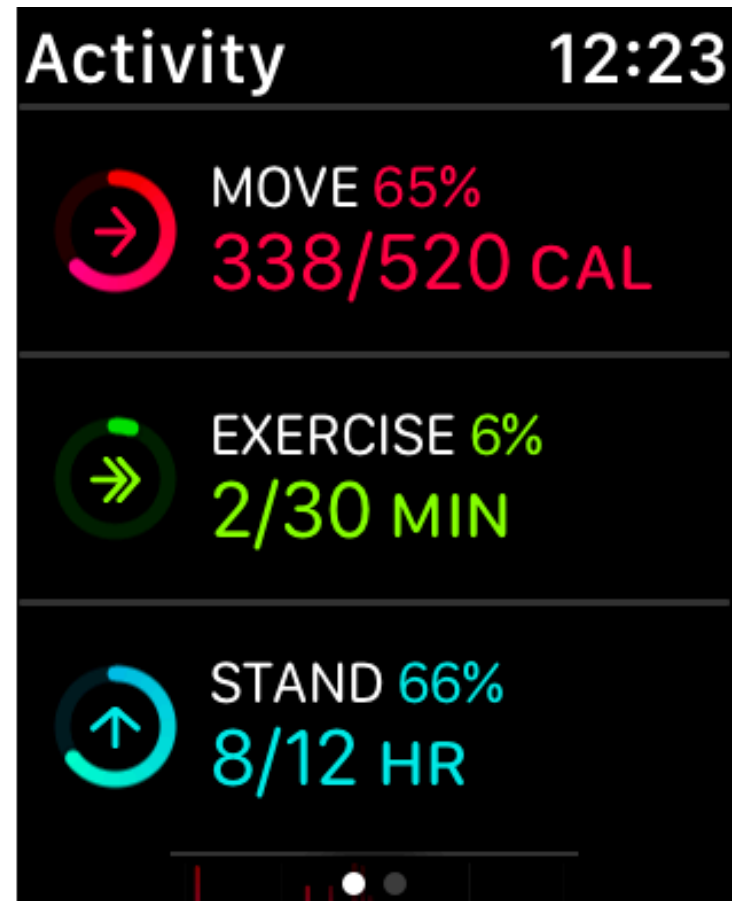
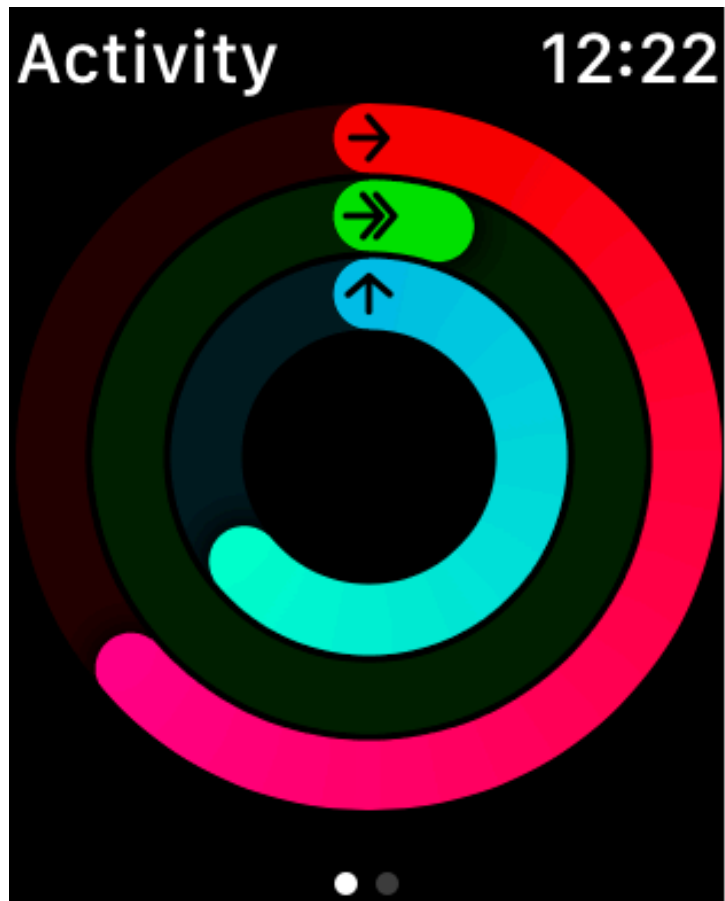
THE NEW INQUIRY



White Collar Crime Risk Zones uses machine learning to predict where financial crimes are mostly likely to occur across the US. To learn about our methodology, read our [white paper](#).

By [Brian Clifton](#), [Sam Lavigne](#) and [Francis Tseng](#) for *The New Inquiry Magazine*, Vol. 59: [ABOLISH](#).





UPDATED JAN. 27, 2020, AT 3:08 PM

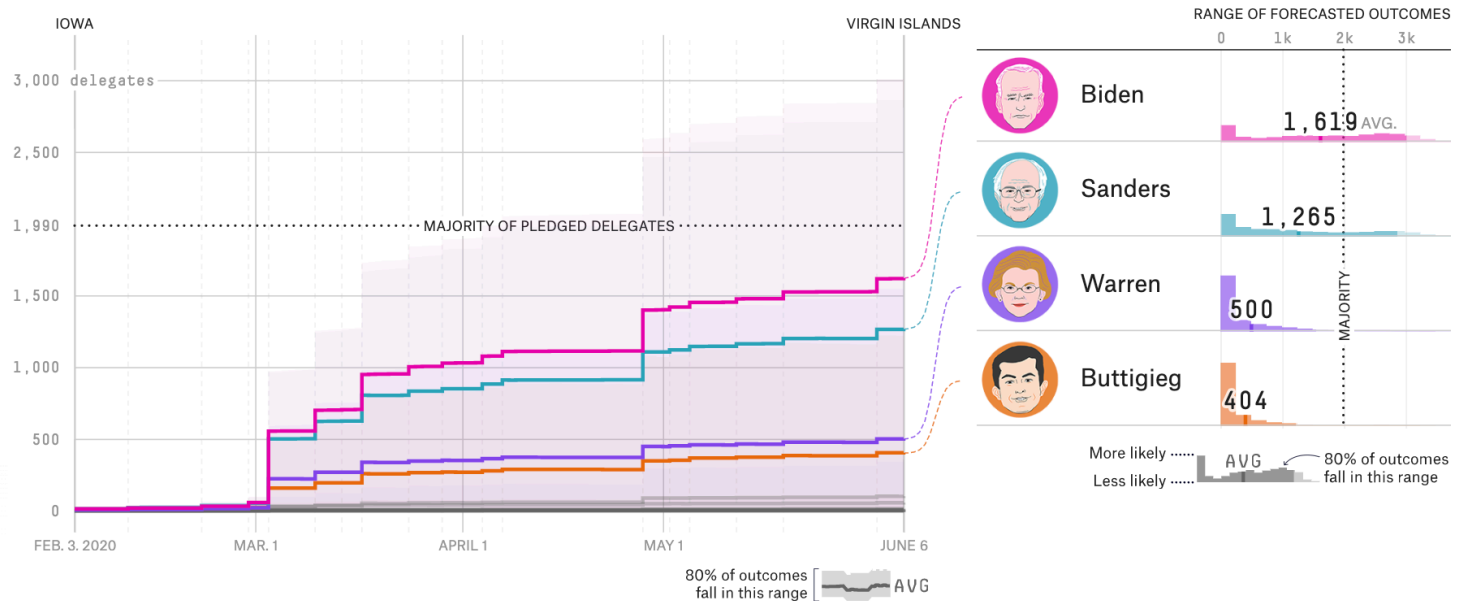
Who Will Win The 2020 Democratic Primary?

Our latest forecast for how many pledged delegates each candidate will win after all states have voted

FiveThirtyEight's model simulates the primary season thousands of times to find the most likely outcome for each candidate. The chart shows how many delegates, on average, each candidate is projected to have pledged to them at each point in the primary season, along with a range of possible delegate counts. We're also showing the distribution of simulated final pledged delegate counts in the table, where taller bars mean a more likely outcome. Right now, many candidates, even the front-runners, wind up with tall bars close to zero — generally, those are simulations where the candidate dropped out before having a chance to accumulate many delegates.

National view

- MONDAY, FEB. 3
Iowa
- TUESDAY, FEB. 11
New Hampshire
- SATURDAY, FEB. 22
Nevada
- SATURDAY, FEB. 29
South Carolina
- TUESDAY, MAR. 3
Super Tuesday
California
Texas
North Carolina
Virginia
Massachusetts
Minnesota
Colorado
Tennessee
Alabama
Oklahoma
Arkansas
Utah
Maine
Vermont



100 years of world cuisine

38,000,000 deaths 25 conflicts 1915 - present
100yearsofworldcuisine.com



Parachute/Drive-By/Drop-In Research



Parachute/Drive-By/Drop-In Research



“Seasoned community members described being unable to alter a history of academics descending on the community, collecting data, and then leaving, without providing study results or any discernable improvements in health (described as “drive-by research”).”

Parachute/Drive-By/Drop-In Research



“Seasoned community members described being unable to alter a history of academics descending on the community, collecting data, and then leaving, without providing study results or any discernable improvements in health (described as “drive-by research”).”



The New York Times

Opinion

Flying While Trans

The T.S.A. subjects transgender passengers like me to humiliating and dehumanizing treatment.

By Alex Marzano-Lesnevich

Mx. Marzano-Lesnevich is a professor at Bowdoin College.

