

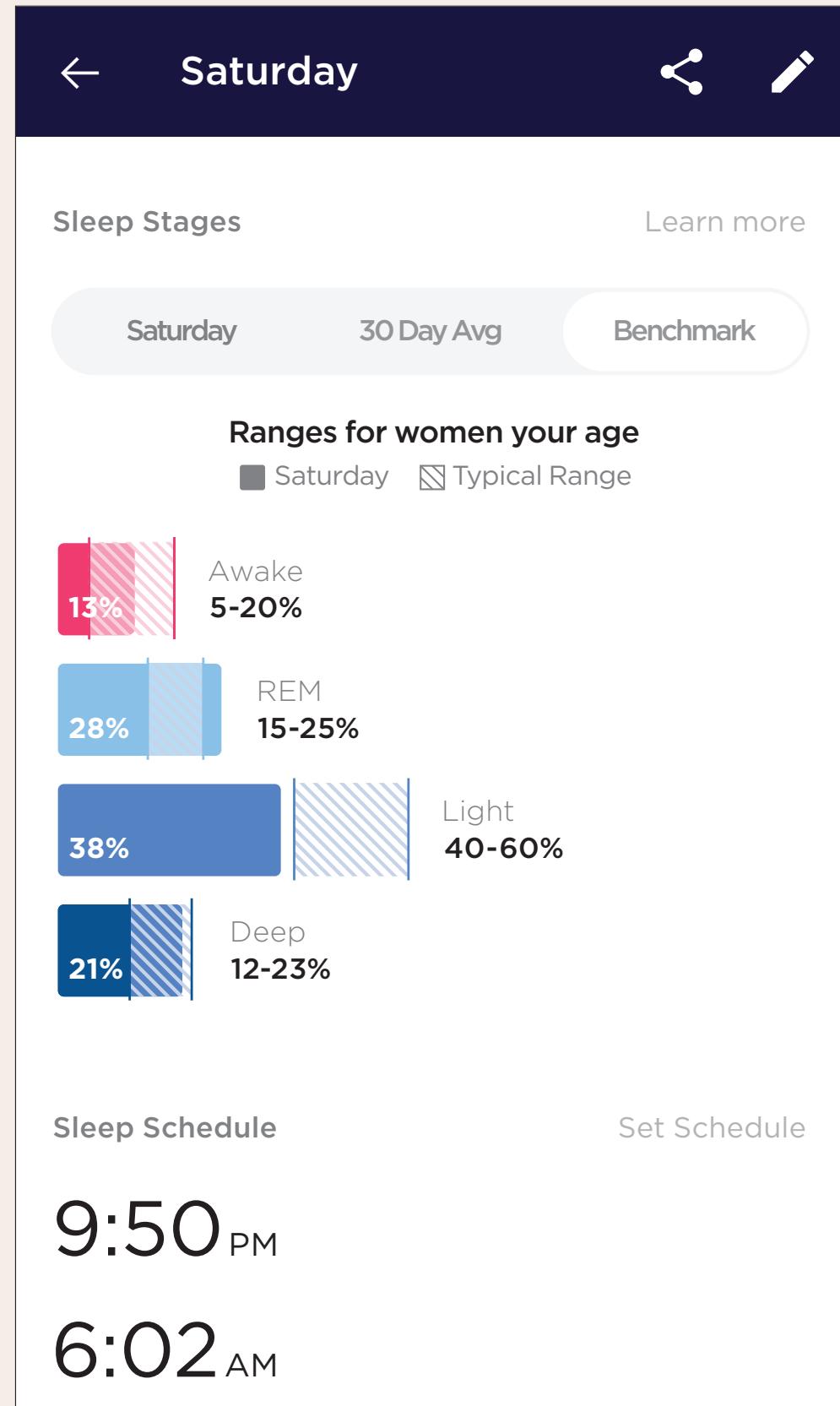
Taming Treacherous Data: Day 1, Morning

Arguments in Visualizations

Wednesday 11 December 2019, DHDownunder, Newcastle, Australia

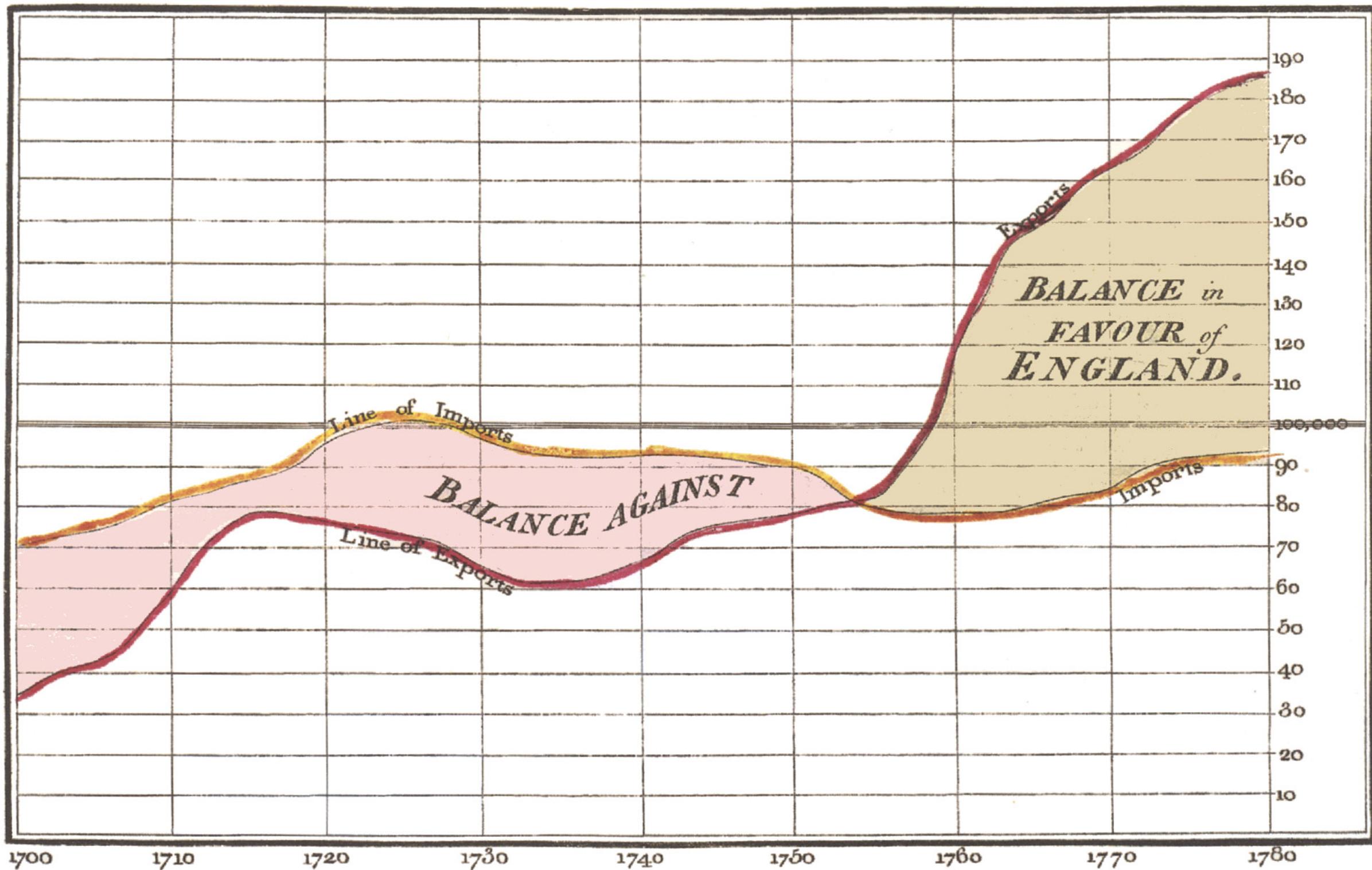
**Visualizations are not
objective**

Truth effect



Cultural context

Exports and Imports to and from DENMARK & NORWAY from 1700 to 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 W^m Playfair

Neale sculpt 352, Strand, London.

H
1

Periodic Table

He
2

Li
3

Be
4

Na
11

Mg
12

K
19

Ca
20

Rb
37

Sr
38

Cs
55

Ba
56

Fr
87

Ra
88

Ce
58

Th
90

The Royal Society of Chemistry's interactive periodic table features history, alchemy, podcasts, videos, and data trends across the periodic table. Click the tabs at the top to explore each section. Use the buttons above to change your view of the periodic table and view Murray Robertson's stunning Visual Elements artwork. Click each element to read detailed information.

Sc
21

Ti
22

V
23

Cr
24

Mn
25

Fe
26

Co
27

Ni
28

Cu
29

Zn
30

Ga
31

Ge
32

Y
39

Zr
40

Nb
41

Mo
42

Tc
43

Ru
44

Rh
45

Pd
46

Ag
47

Cd
48

In
49

Sn
50

La
57

Hf
72

Ta
73

W
74

Re
75

Os
76

Ir
77

Pt
78

Au
79

Hg
80

Tl
81

Pb
82

Ac
89

Rf
104

Db
105

Sg
106

Bh
107

Hs
108

Mt
109

Ds
110

Rg
111

Cn
112

Nh
113

Fl
114

Pr
59

Nd
60

Pm
61

Sm
62

Eu
63

Gd
64

Tb
65

Dy
66

Ho
67

Er
68

Tm
69

Pa
91

U
92

Np
93

Pu
94

Am
95

Cm
96

Bk
97

Cf
98

Es
99

Fm
100

Md
101

No
102

Lr
103

B
5

C
6

N
7

O
8

F
9

Ne
10

Al
13

Si
14

P
15

S
16

Cl
17

Ar
18

Ga
31

Ge
32

As
33

Se
34

Br
35

Kr
36

In
49

Sn
50

Sb
51

Te
52

I
53

Xe
54

Tl
81

Pb
82

Bi
83

Po
84

At
85

Rn
86

Lv
116

Ts
117

Og
118

Eu
63

Gd
64

Tb
65

Dy
66

Ho
67

Er
68

Tm
69

Yb
70

Lu
71

Pr
59

Nd
60

Pm
61

Sm
62

Eu
63

Gd
64

Tb
65

Dy
66

Ho
67

Er
68

Tm
69

Yb
70

Pa
91

U
92

Np
93

Pu
94

Am
95

Cm
96

Bk
97

Cf
98

Es
99

Fm
100

Md
101

No
102

Lr
103

THE PERIODIC TABLE OF **FEMINISM**

PRECIOUS METALS		CATALYSTS		CONDUCTORS		EXPLOSIVES	
M Mary Wollstonecraft	1	Mtf Maria Teresa Ferrani	1	Ad Andrea Dworkin	2	St Sojourner Truth	1
Ep Emmeline Pankhurst	1	Md Maria Derlaismes	1	Cc Clara Campoamor	1	Mw Monique Wittig	2
Ew Emily Wilding Davison	1	Ff The Famous Five	1	Az Anna Maria Mozzoni	1	Am Anne-Marie Slaughter	4
S Simone de Beauvoir	2	Nw Naomi Wolf	3	Av Anna Filosofova	1	Bs Barbara Smith	2
Kc Kimberlé Crenshaw	3	Ks Kate Sheppard	1	Ne Nawal El Saadawi	2	Cp Caroline Criado-Perez	4
Bf Betty Friedan	2	Eg Elizabeth Gennet Anderson	1	Ma Karen Ingala Smith	1	Fh Frances Haider	1
Cn Chimamanda Ngozi Adichie	4	Eg Alexandria Kollontai	1	J Judith Butler	3	Cl Carla Lonzi	2
Mf Margaret Fuller	1	Rbg Ruth Bader Ginsburg	2	Ma Mary Akrami	4	O Oprah Winfrey	3
Gs Gloria Steinem	2	Ah Anita Hill	3	Mst Marie Stritt	1	Hx He Xiangning	1
Lb Laura Bates	4	Ss Sheryl Sandberg	4	Mr Mariarosa Dalla Costa	2	Au Anita Augspurg	1
Ms Margaret Sanger	1	Sa Sophie Adlersparre	1	Bk Beyoncé Knowles-Carter	4	Mft Millicent Fawcett	1
Hex Hélène Cixous	2	Al Audre Lorde	2	Fk Frida Kahlo	2	Km Kate Millett	4
Ab Alison Bechdel	3	E Emma Watson	4	My Malala Yousafzai	4	Jb Josephine Butler	1
Aa Amani al-Khatahtbeh	4	Hd Henrietta Dugdale	1	Fy Florynce Kennedy	2	Gg Germaine Greer	2
Hd Jayaben Desai	2	Jd Jessica Valenti	2	Egm Emma Goldman	2	Rg Roxane Gay	4
Jv Jessica Valenti	4	Jv Jude Kelly	1	Ft Li Tingting	1	Lt Li Tingting	4
Rs Rebecca Solnit	4	St Stanton/Anthony	1	Ee Eve Ensler	3	St Leymah Gbowee	2
St Sarah Tashiro	1	Rb Richards/Baumgardner	3	Lg Linda West	4	Pm Pauli Murray	2
El Elaine Welteroth	2	Ee Eve Ensler	4	Tk Tawakkol Karman	4	Jc Judy Chicago	2
Eg Eva Ensler	4	Ha Husssein/Ali	3	Bh Bell Hooks	2	Su Sisters Uncut	4
Ft Florynce Kennedy	1	Lw Lindy West	4	Ar Adrienne Rich	2	Pl Paris Lees	4
St Spice Girls	3	Tk Tawakkol Karman	4	Pl Paris Lees	1	Gu Guerrilla Girls	3
Uk Una Kroll	2	Bh Bell Hooks	2	Kh Kathleen Hanna	3	Gu Guerrilla Girls	3
El Elaine Welteroth	4	Ar Adrienne Rich	2	St Shulamith Firestone	2	St Shulamith Firestone	4
Eg Eva Ensler	2	Pl Paris Lees	4	Jc Judy Chicago	2	F FEMEN	4
Ft Florynce Kennedy	4	Gu Guerrilla Girls	3	St Shulamith Firestone	1	Gu Guerrilla Girls	3

Key

Precious metals: the leaders, the face of the movements

Catalysts: pioneers, fire-starters

Conductors: bringing people together, the organisers

Diatom: women working together

Stabilizers: peaceful, pacifists

Explosives: radicals, anarchists, violent

4TH WAVE

Kinds of argument in visualizations

Kinds of argument in visualizations

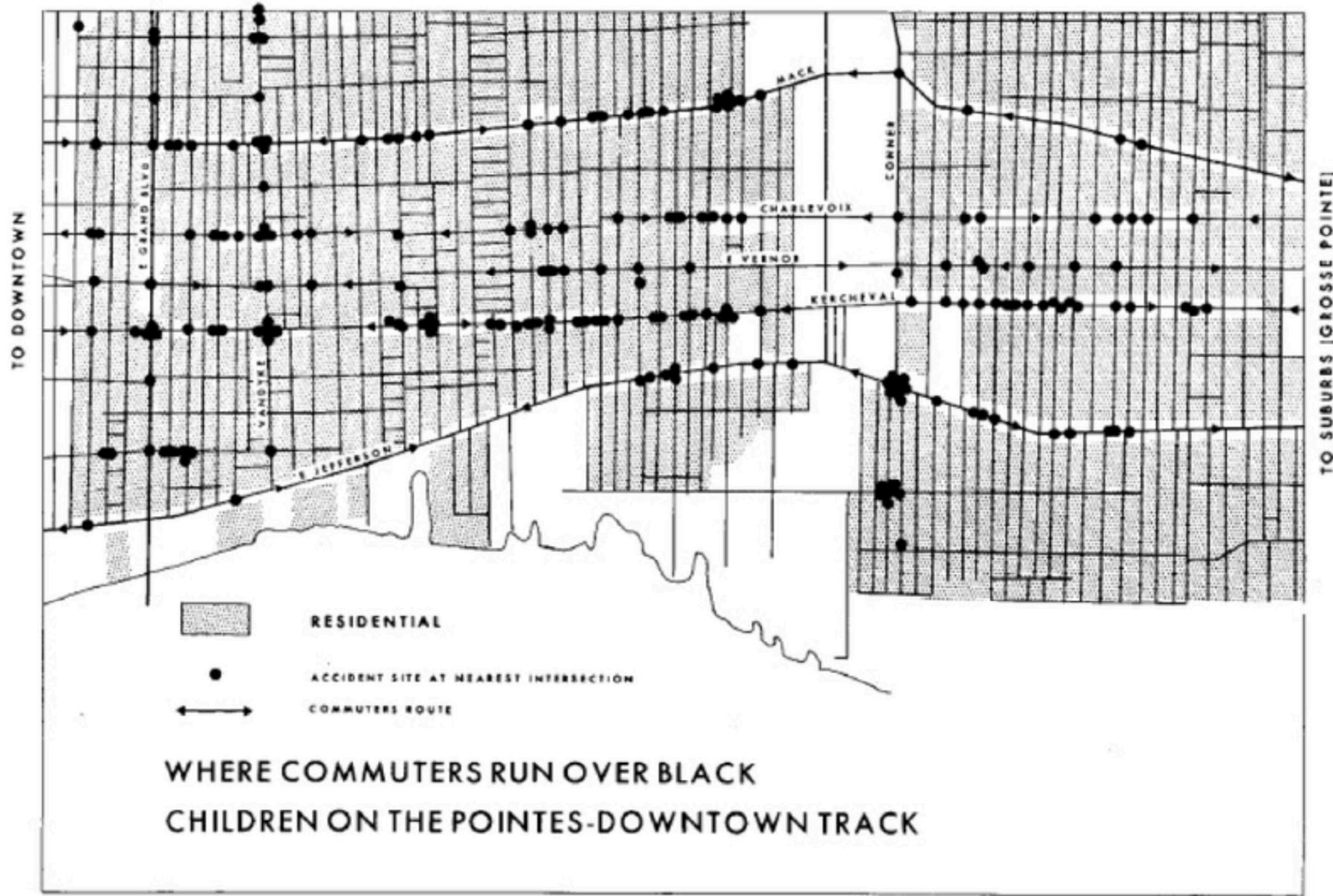
» **Explicit argumentation**

Kinds of argument in visualizations

- » Explicit argumentation
- » Implicit argumentation

Explicit argumentation

» **Titles**



Gwendolyn Warren was the Administrative Director of the Detroit Geographic Expedition and Institute, a collaboration between Black youth in Detroit and white academic geographers that lasted from 1968-1971.

The group worked together to map aspects of the urban environment related to children and education. Warren also worked to set up a free school where youth could take college classes in geography for credit.

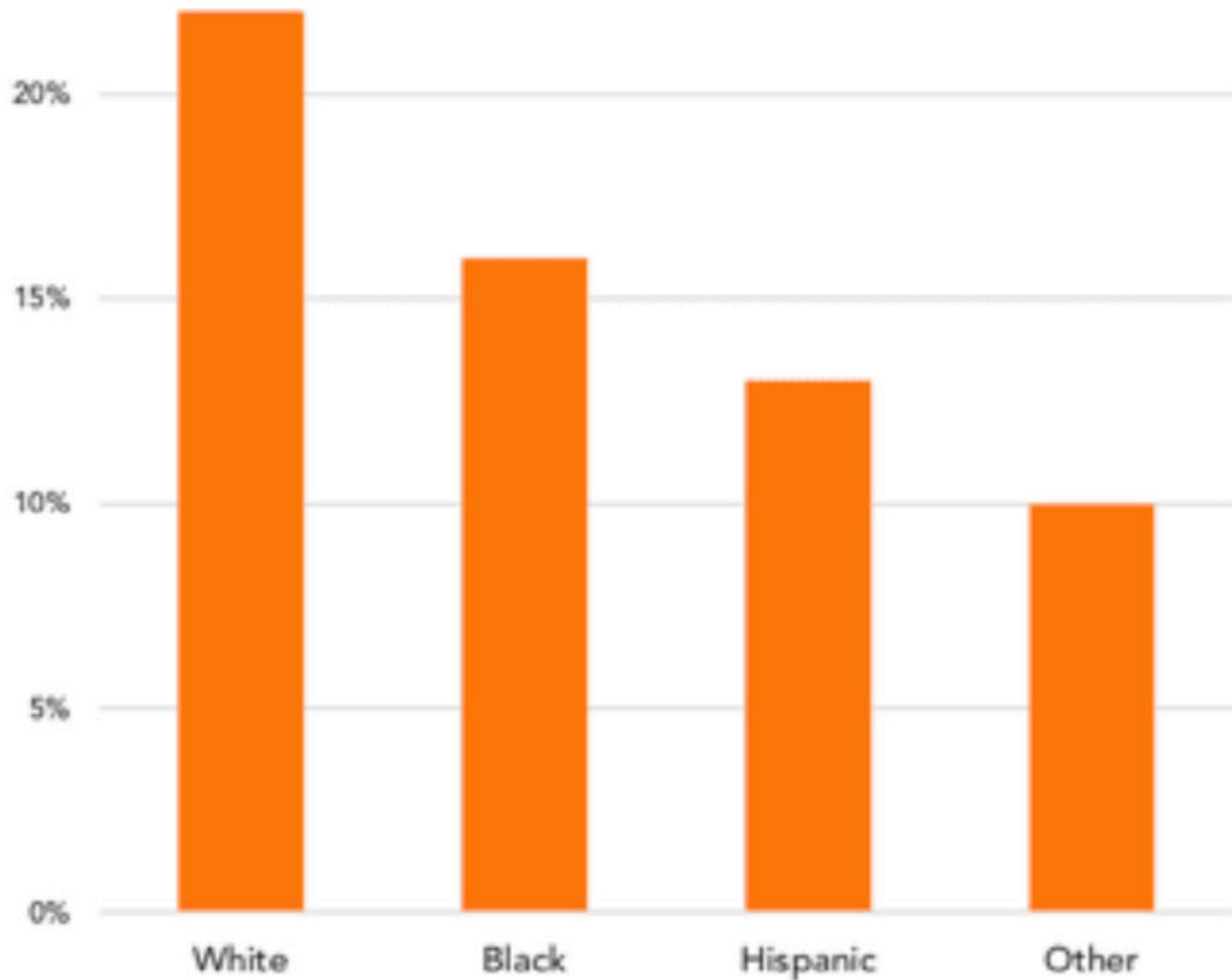
Credit: The Detroit Geographic Expedition and Institute

Source: Gwendolyn Warren, "Field Notes III: The Geography of Children" (1970)

Permission: Pending

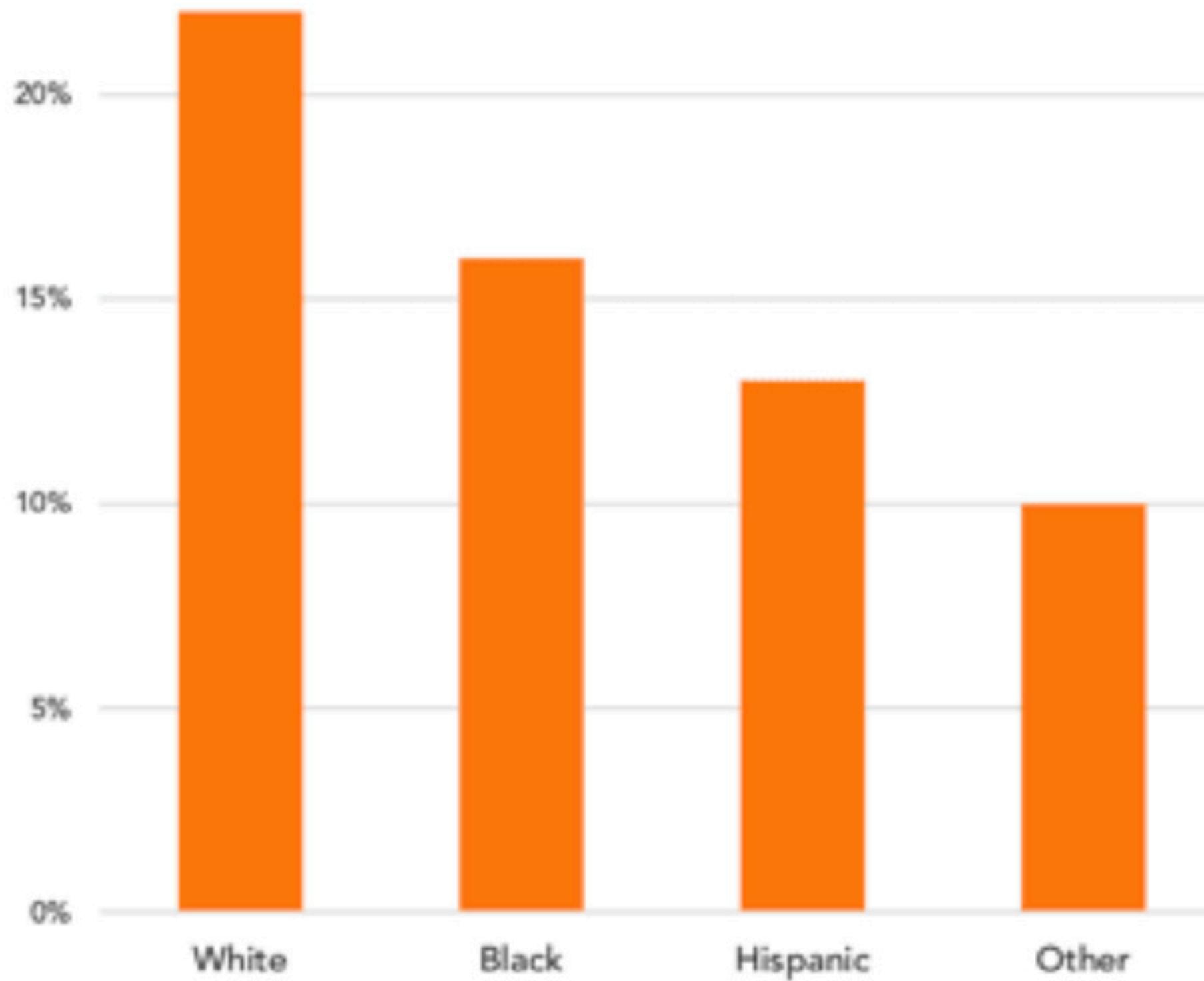
Mental Health in Jail

Rate of mental health diagnosis of inmates



Racism in Jail

People of color less likely to get mental health diagnosis



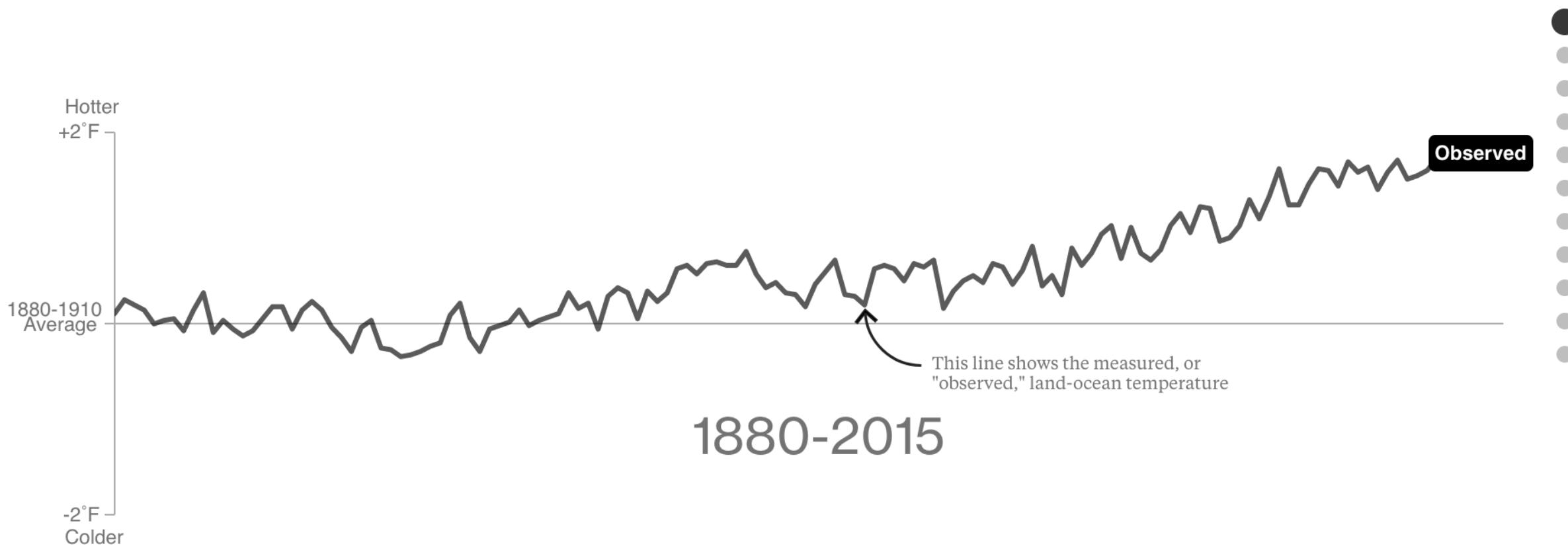
Explicit argumentation

- » Titles
- » Captions

What's Really Warming the World?

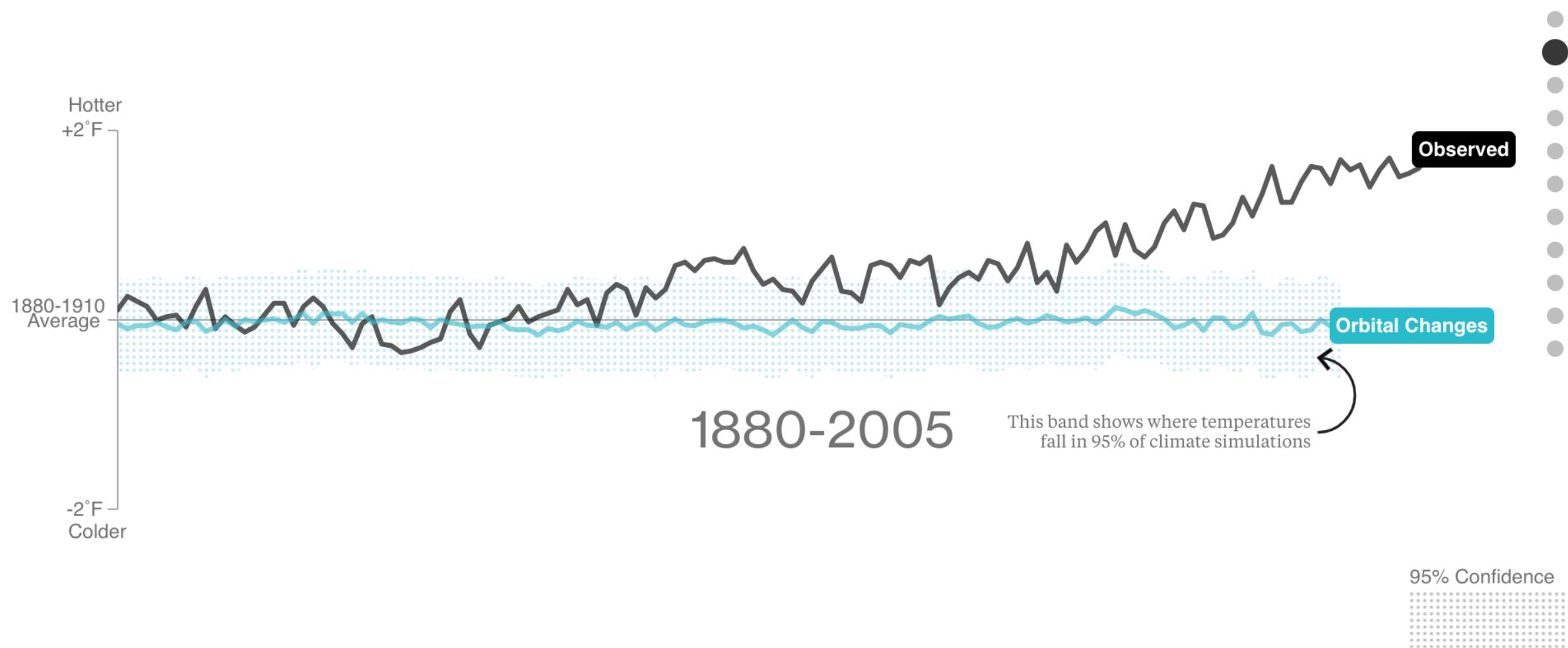
By Eric Roston  and Blacki Migliozzi  | June 24, 2015

Skeptics of manmade climate change offer various natural causes to explain why the Earth has warmed 1.4 degrees Fahrenheit since 1880. But can these account for the planet's rising temperature? Scroll down to see how much different factors, both natural and industrial, contribute to global warming, based on findings from NASA's Goddard Institute for Space Studies.



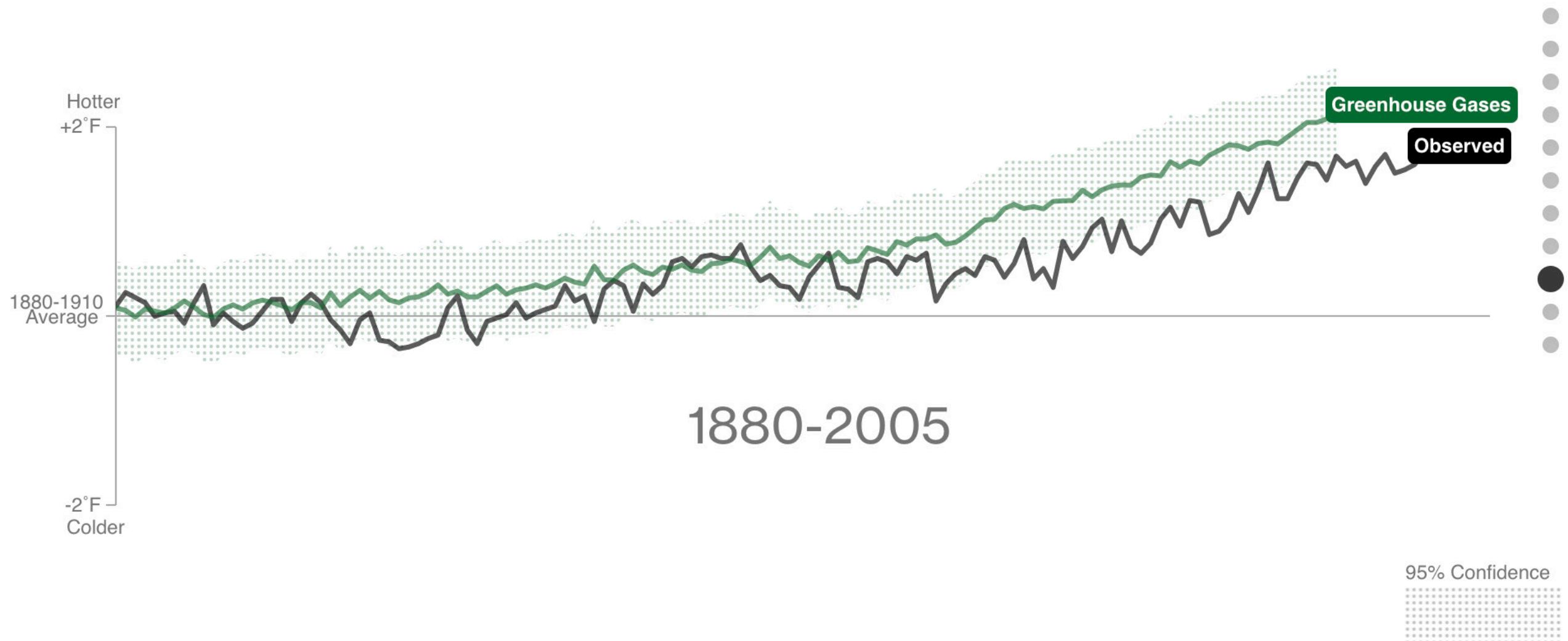
Is It the Earth's Orbit?

The Earth wobbles on its axis, and its tilt and orbit change over many thousands of years, pushing the climate into and out of ice ages. Yet the influence of orbital changes on the planet's temperature over 125 years has been negligible.



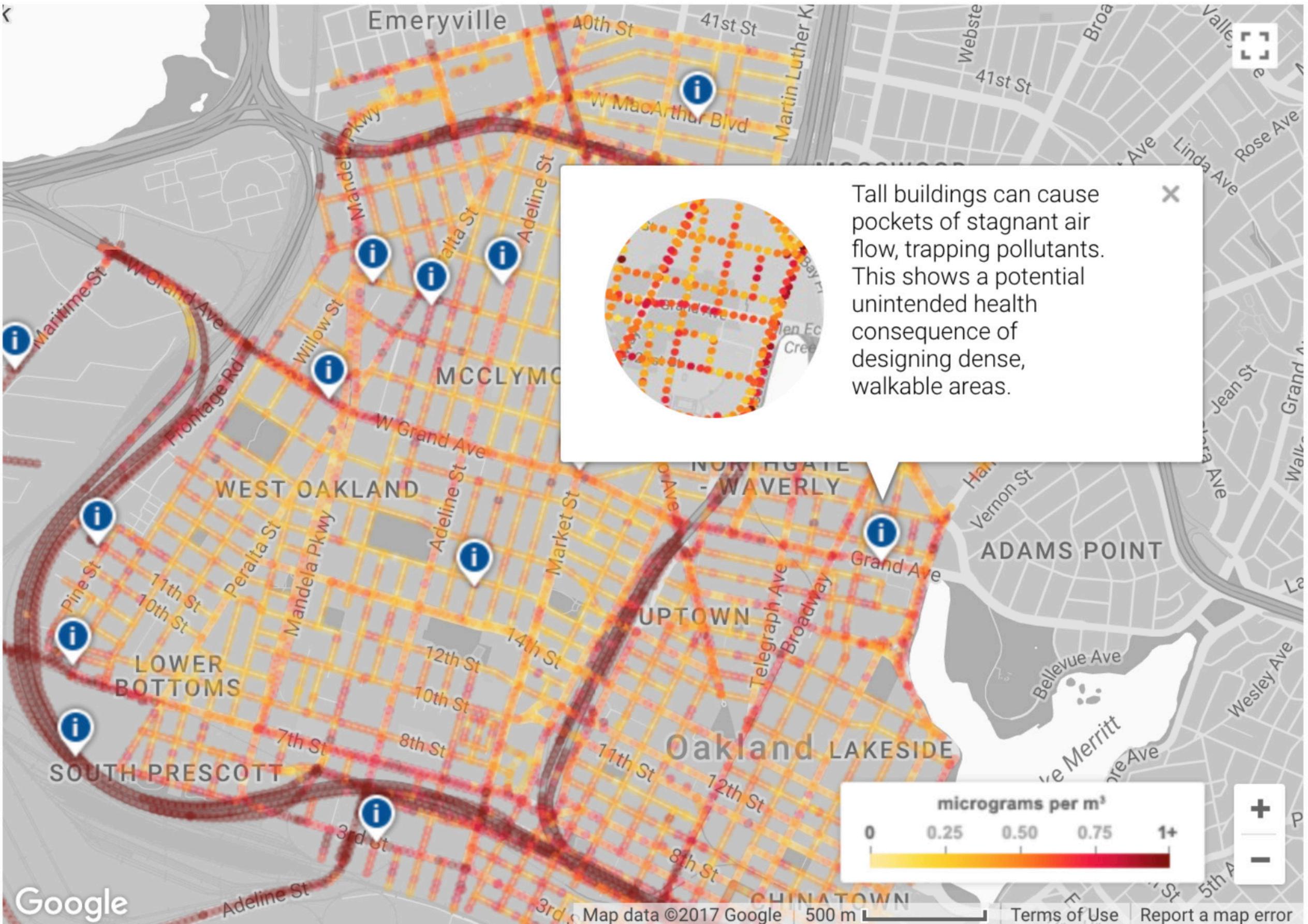
No, It Really Is Greenhouse Gases.

Atmospheric CO₂ levels are 40 percent higher than they were in 1750. The green line shows the influence of greenhouse gas emissions. It's no contest.



Explicit argumentation

- » Titles
- » Captions
- » Annotations



Tall buildings can cause pockets of stagnant air flow, trapping pollutants. This shows a potential unintended health consequence of designing dense, walkable areas.

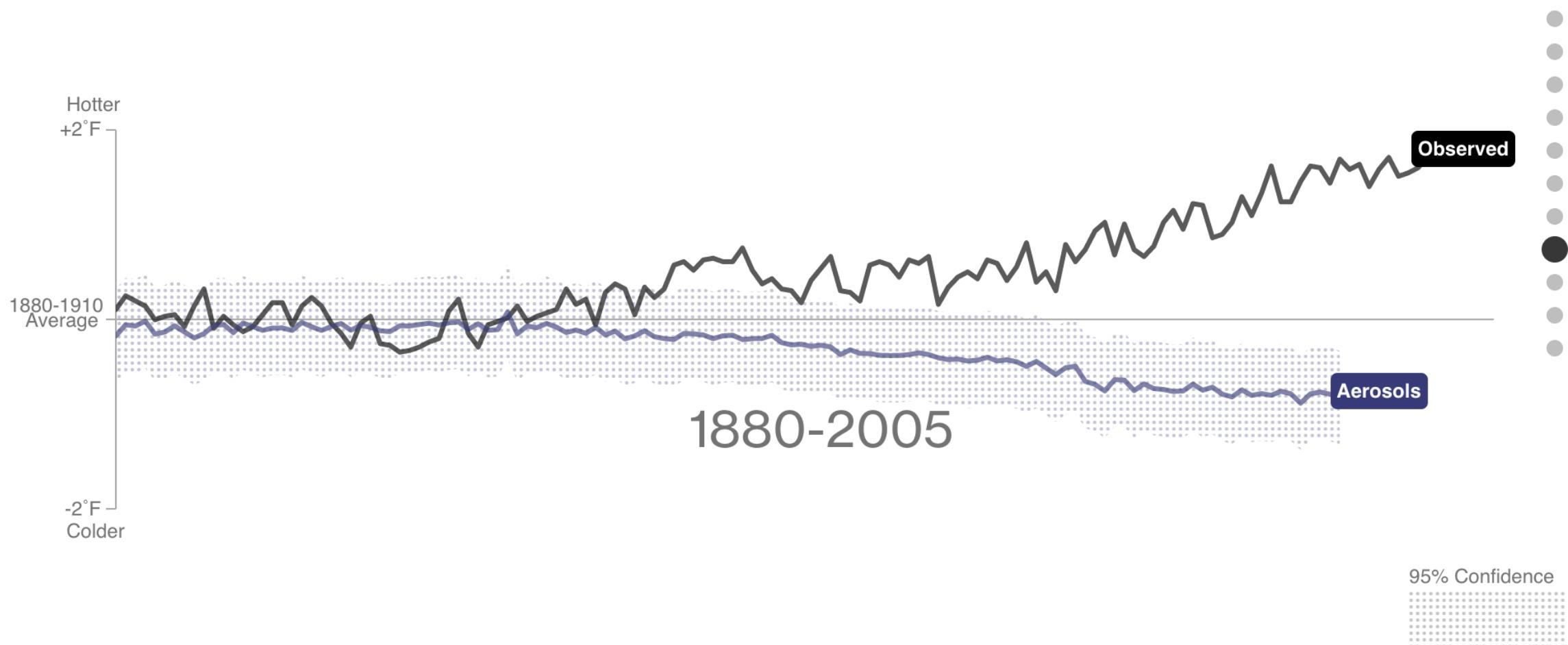
Air quality data from Google/Aclima; analysis by Apte et al / EDF. Colors on the map do not correlate to colors on the Air Quality Index.

Explicit argumentation

- » Titles
- » Captions
- » Annotations
- » Emphases

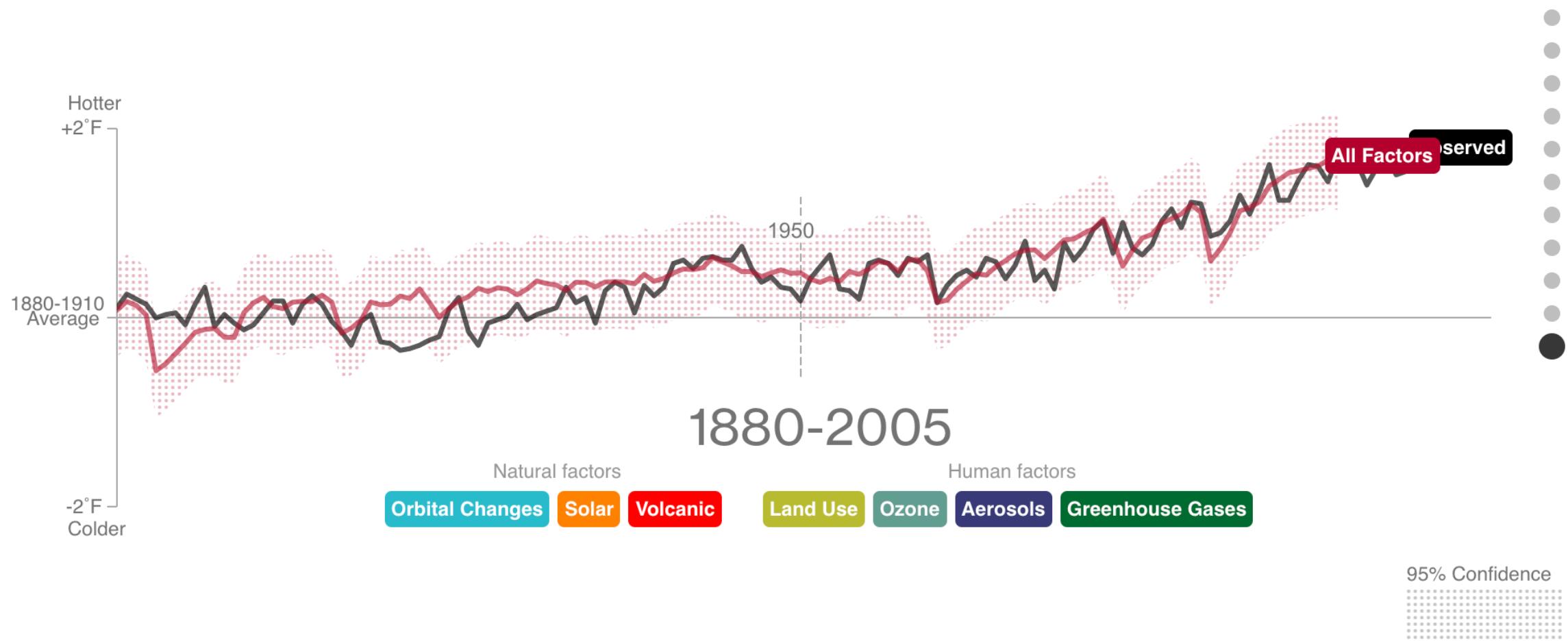
Or Aerosol Pollution?

Some pollutants cool the atmosphere, like sulfate aerosols from coal-burning. These aerosols offset some of the warming. (Unfortunately, they also cause acid rain.)



Compare and Contrast

Putting the possible natural and human causes of climate change alongside one another makes the dominant role of greenhouse gases even more plainly visible. The only real question is: What are we going to do about it?



Implicit argumentation

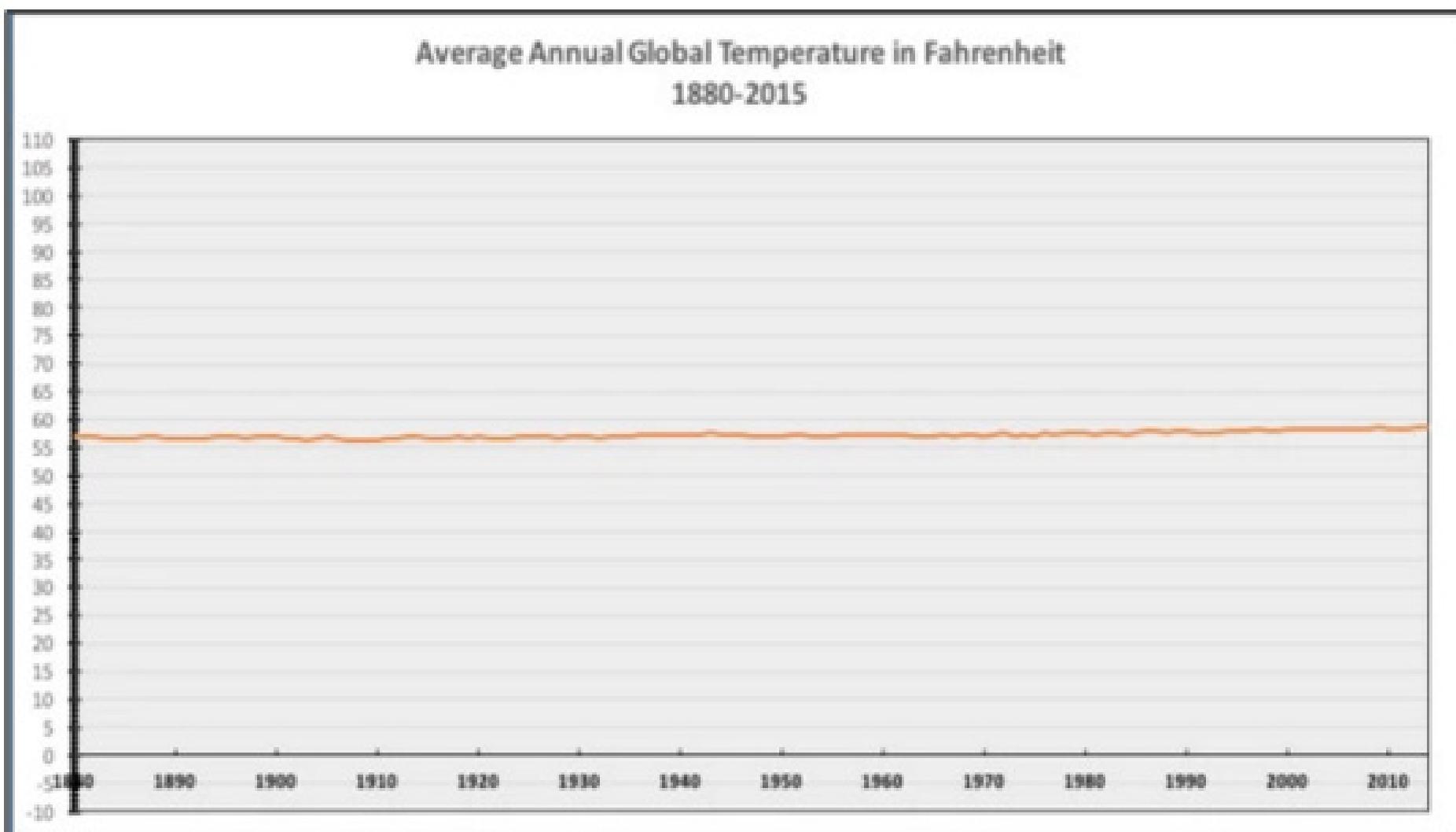
Implicit argumentation

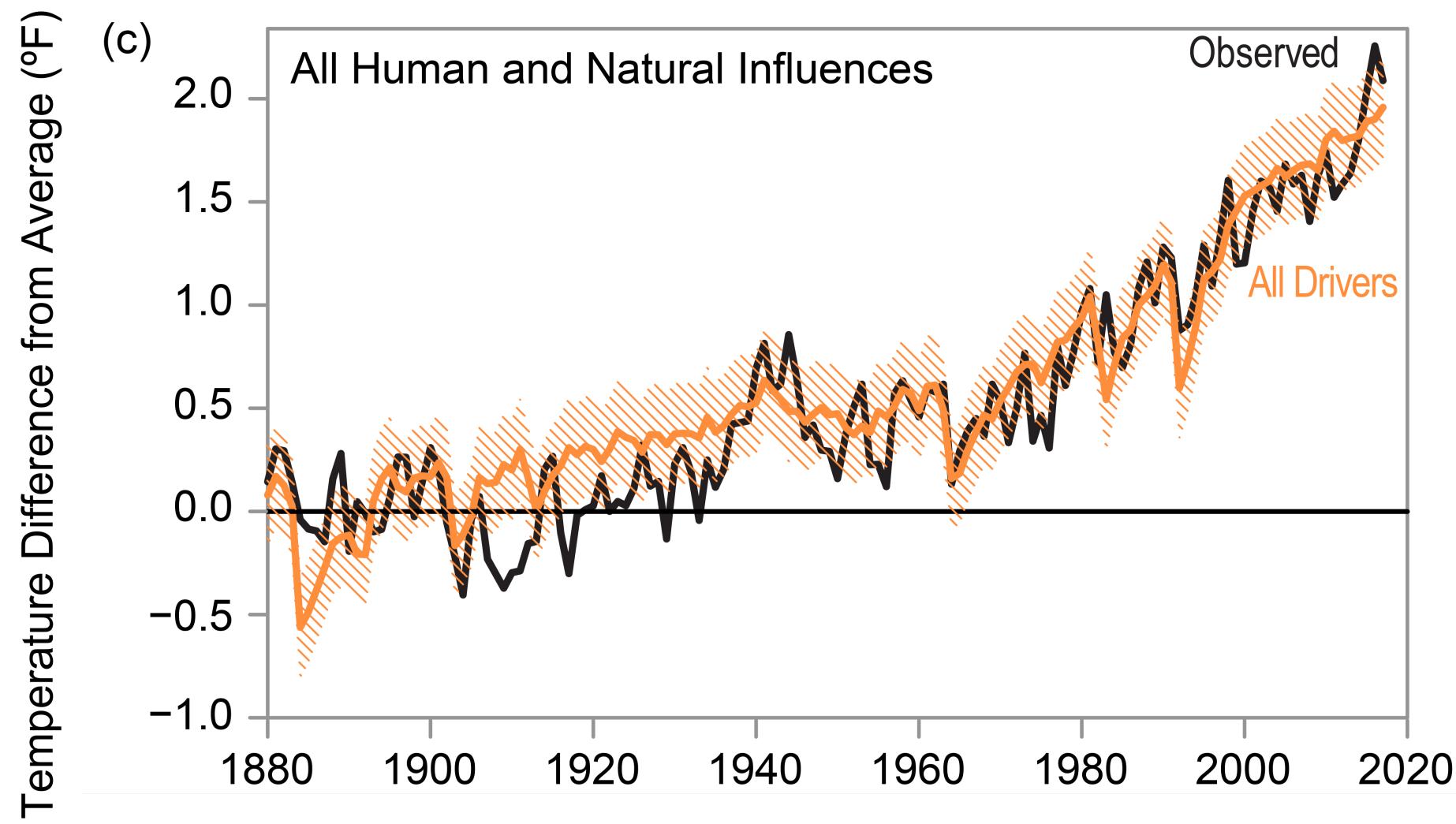
» **Scale**



The only #climatechange chart you need to see. natl.re/wPKpro

(h/t [@powerlineUS](#))



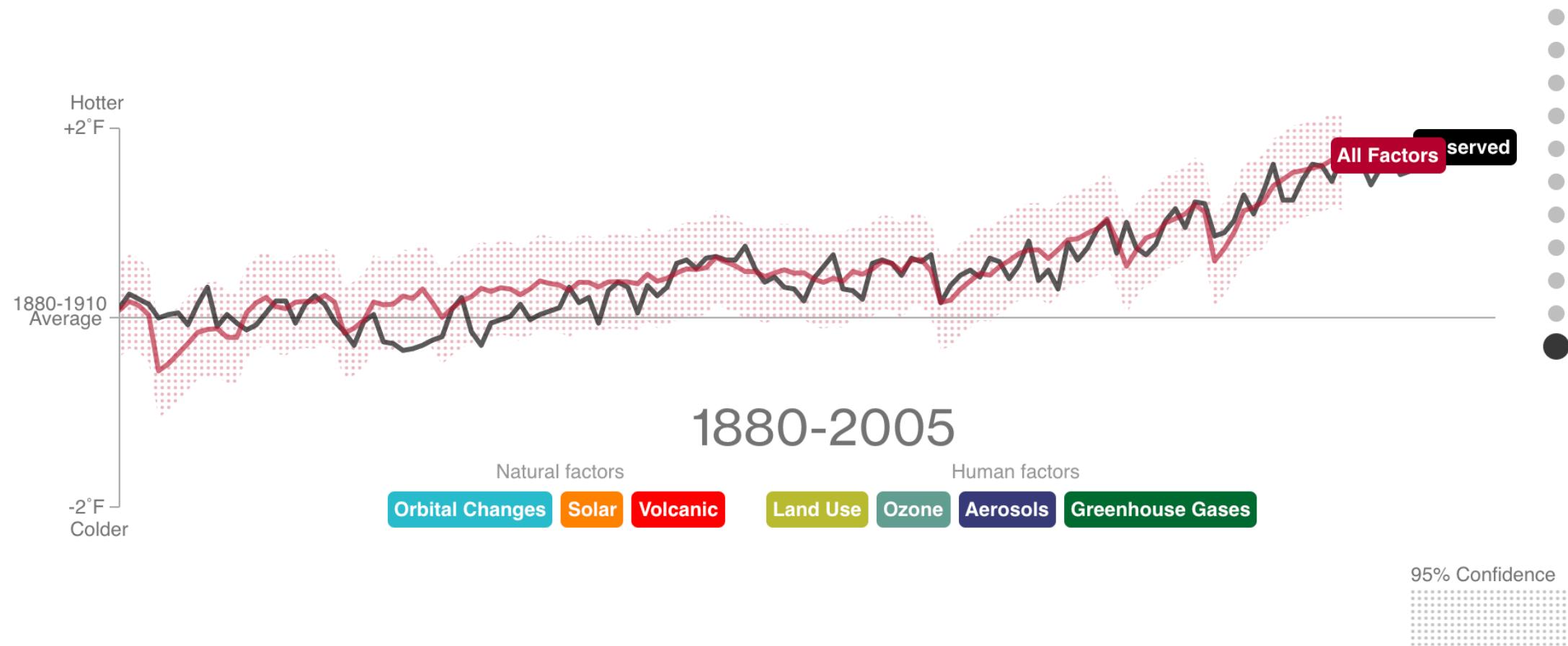


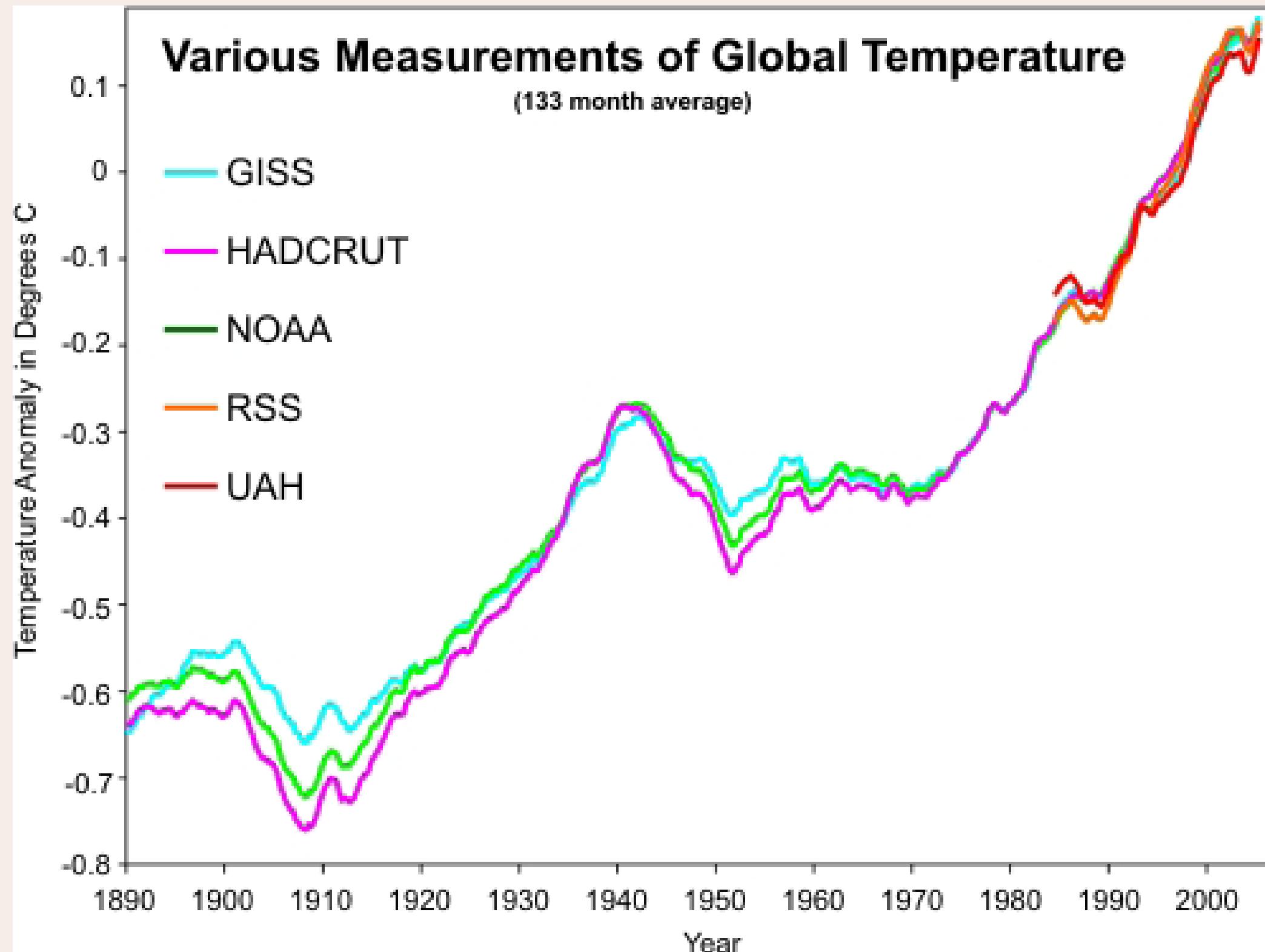
Implicit argumentation

- » Scale
- » Categorizations

Compare and Contrast

Putting the possible natural and human causes of climate change alongside one another makes the dominant role of greenhouse gases even more plainly visible. The only real question is: What are we going to do about it?





Implicit argumentation

- » Scale
- » Categorizations
- » Data breaks



names on your screen:



1835 - 1964

SHOW TIME-LAPSE

Should I believe this...? Find out



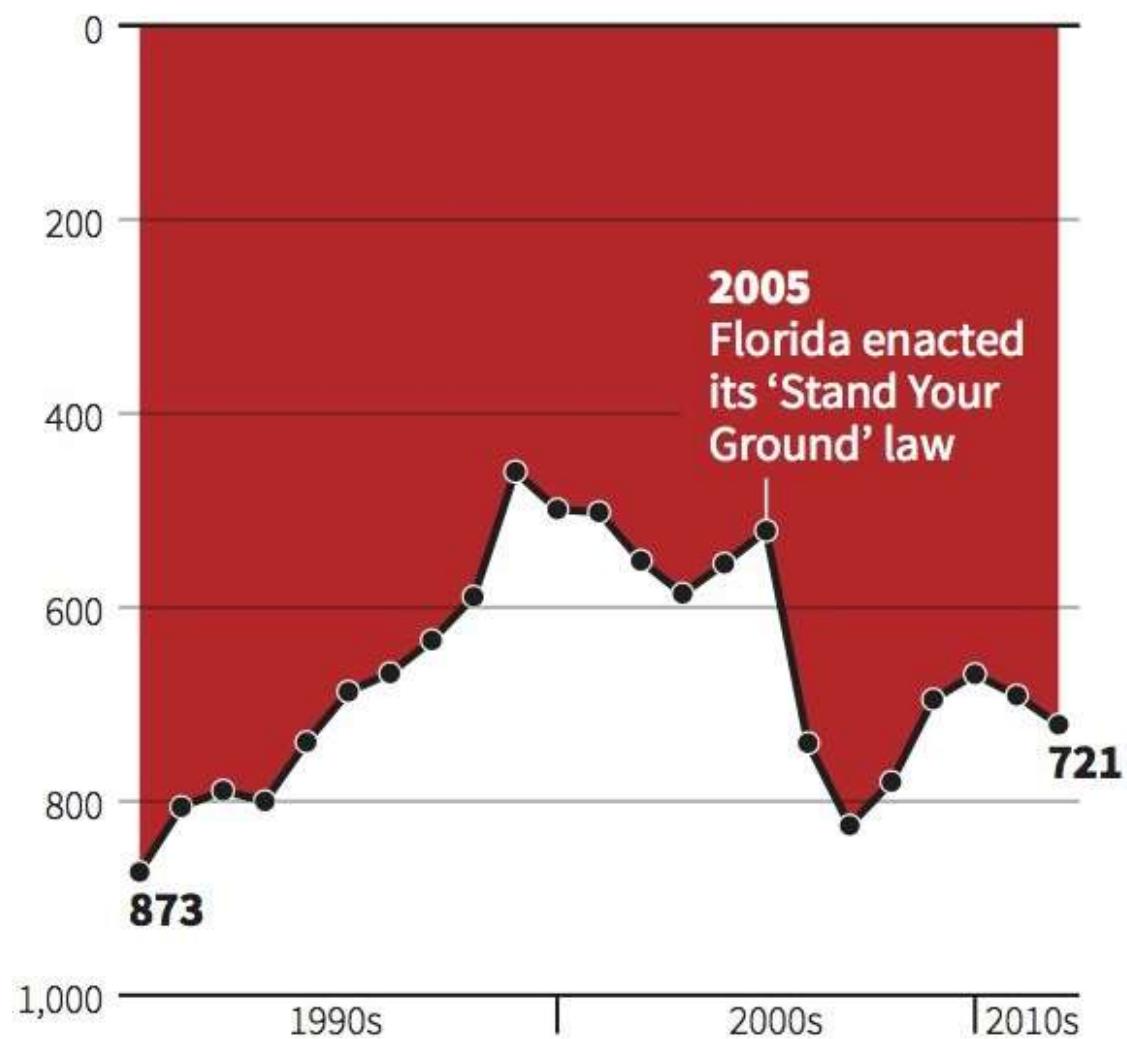
Map by aavt studio using some data © Mapbox © OpenStreetMap | License

Implicit argumentation

- » Data breaks
- » Scale
- » Categorizations
- » Priming - image & color associations

Gun deaths in Florida

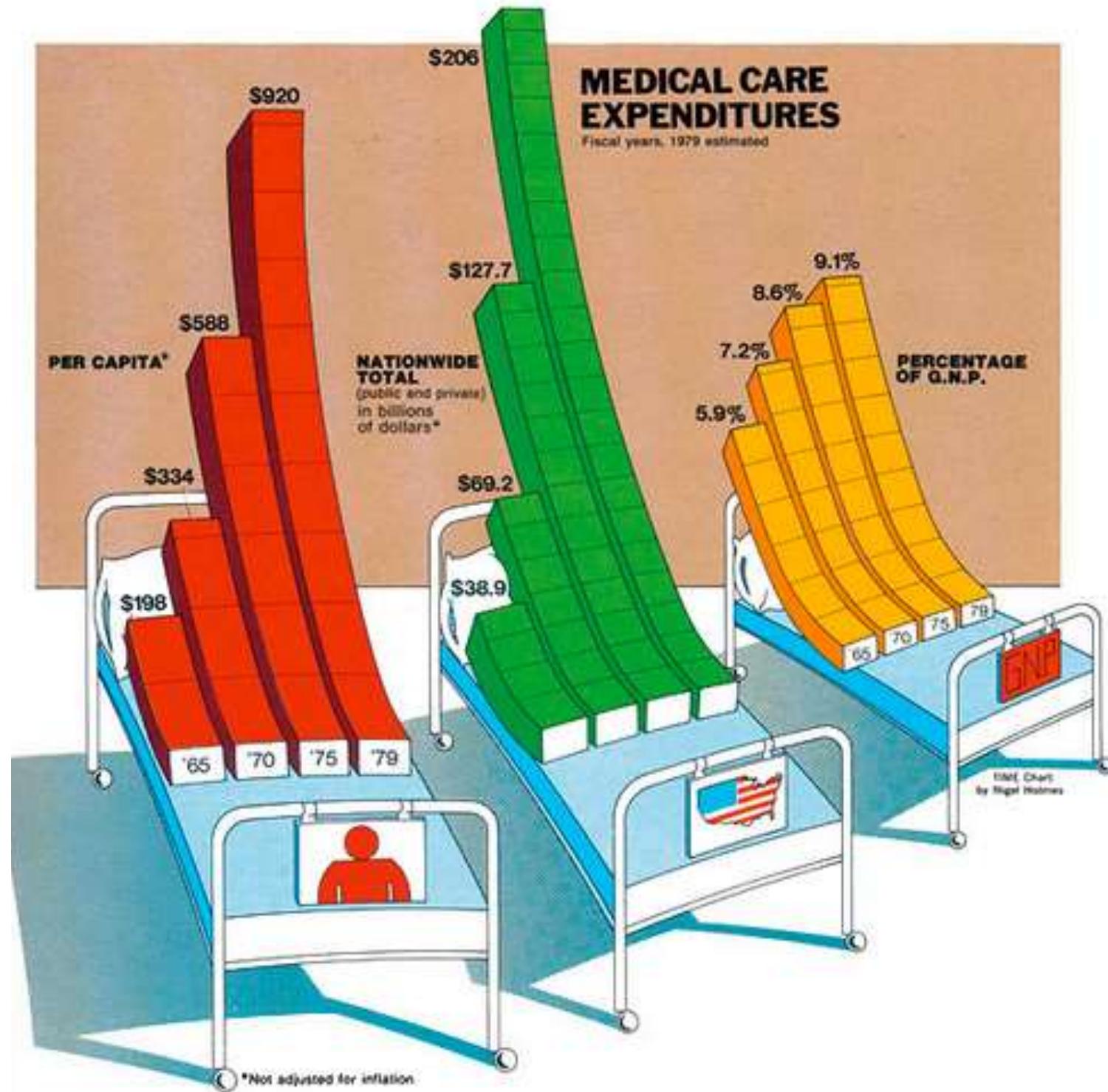
Number of murders committed using firearms



Source: Florida Department of Law Enforcement

C. Chan 16/02/2014

REUTERS



Implicit argumentation

- » Data breaks
- » Scale
- » Categorizations
- » Priming - image & color associations
- » Nudges - interaction effects

Racial Terror Lynchings

Racial terror lynchings were not limited to the South, but the Southern states had the most in the nation: over 4,000 between 1877 and 1950.

California
2 reported
lynchings

Reported lynching
by county

Implicit argumentation

- » Data breaks
- » Scale
- » Categorizations
- » Priming - image & color associations
- » Nudges - interaction effects
- » Sizing & proportional ink



506,209



198,618



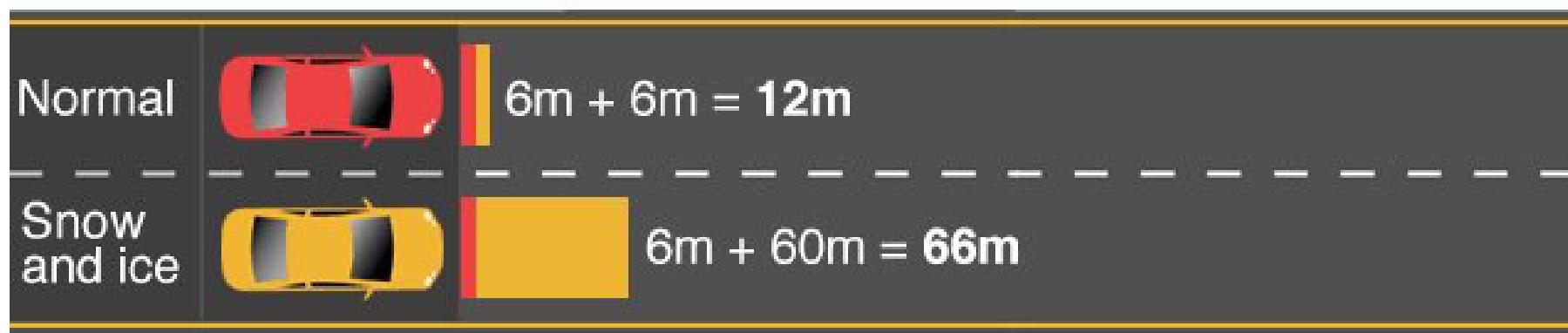
361,252

Stopping distances in snow and ice

30 mph

Thinking distance

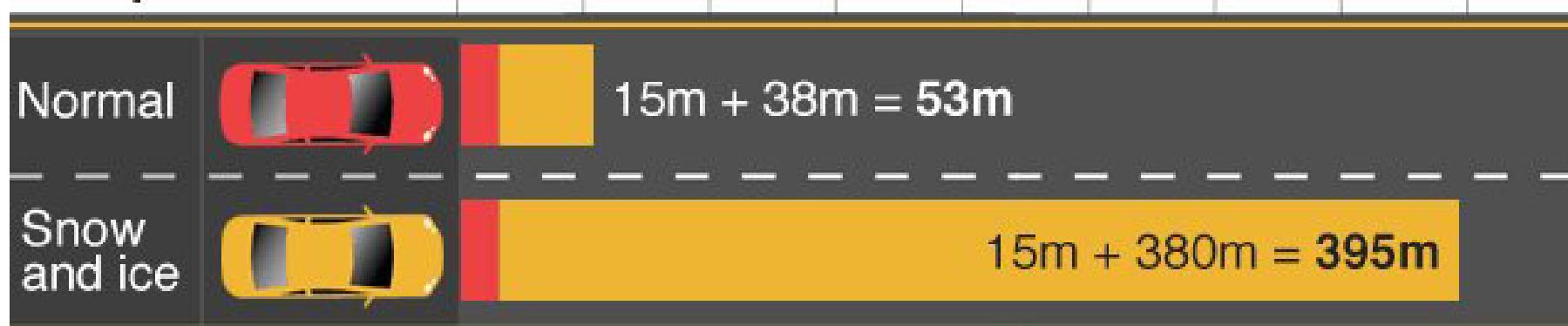
Braking distance



50 mph

Metres

0 50 100 150 200 250 300 350 400



Source: Gov UK, AA

BBC