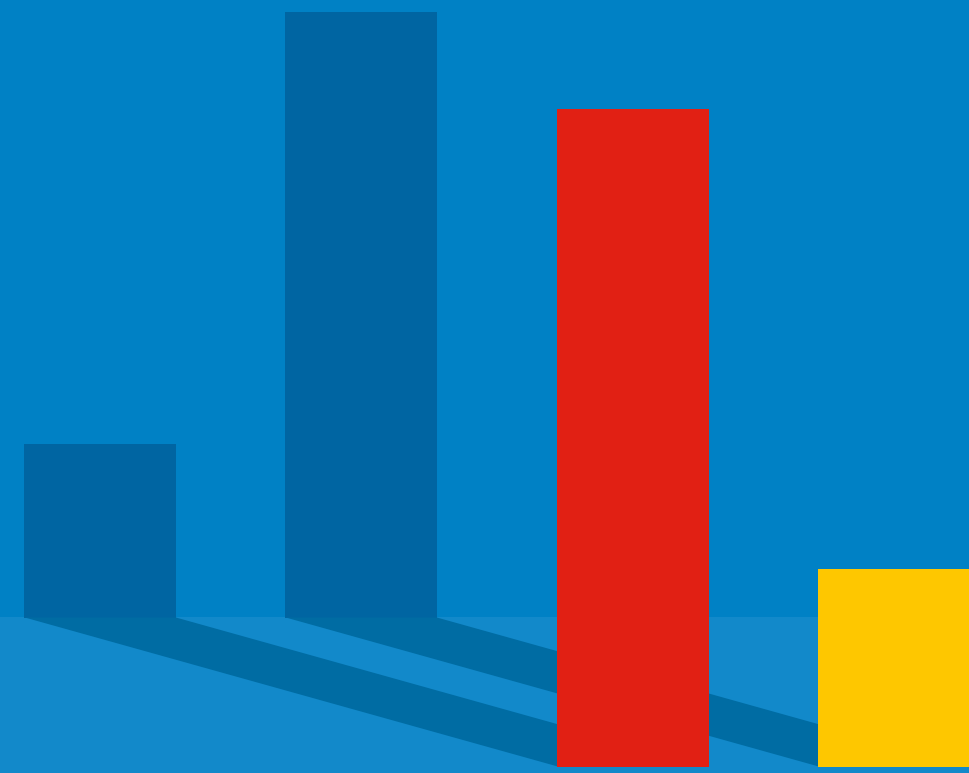


SDSS 2019



what you design
is not what people see

ALBERTO CAIRO

How Charts Lie



Getting Smarter about
Visual Information

Alberto Cairo

New book to be published by W.W. Norton
(October 2019)

To pre-order:

W.W. Norton: <https://books.wwnorton.com/books/detail.aspx?ID=4294998829>

IndieBound: <https://www.indiebound.org/book/9781324001560>

Barnes&Noble: <https://www.barnesandnoble.com/w/how-charts-lie-alberto-cairo/1130420282?ean=9781324001560>

Amazon: https://www.amazon.com/How-Charts-Lie-Getting-Information/dp/1324001569/ref=sr_1_1?keywords=how+charts+lie&qid=1551105523&s=gateway&sr=8-1

A golden age of visualization

The New York Times

Thursday, January 25, 2018

Trump Says He Is Willing to Speak Under Oath to Mueller

President Trump said he was "looking forward" to speaking with Robert S. Mueller III, the special counsel for the Russia inquiry.

Mr. Trump said his lawyers told him it would take "about two to three weeks" to arrange it, but added that any interview would be "subject to my lawyers, and all of that."

More than 160 women say Larry Nassar sexually abused them. Here are his accusers in their own words.

By CARLA CORREA and MEGHAN LOUETT



The Washington Post

Democracy Dies in Darkness

Surprises, alarms, and Mueller

He says "looking forward" to speaking with Robert S. Mueller III, the special counsel for the Russia inquiry.

How an undercover female reporter exposed sexual misconduct at a London charity bash

A Financial Times account of lewd behavior at the minority event, first written and to be a 2,500-word story.

Manhattan District Attorney Says He'll No Longer Accept Contributions From Lawyers With Cases Before Him

By Jesse Blagow, Jan. 25, 10:04 p.m. EST

Chicago Cop Under Investigation Again Over Social Media Posts

By Josh B. Cohen, Jan. 25, 4 a.m. CST

Baltimore Judge Tosses Alford Plea, Rebuking Prosecutor

By Megan Rosen, Jan. 18, 1:22 p.m. EST

THE TAKING

Federal Land Seizures and the Border Fence

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RED CROSS

The Red Cross Forced Out an Executive Over Sexual Harassment — Then Helped Him Land a Job at Save the Children

By Justin Elliott and Arlene Feldt, Jan. 25, 5 a.m. EST

Featured Berles

IGNORING INNOCENCE

The Wrongfully Convicted Forced Into His Deeds

Baltimore Judge Tosses Alford Plea, Rebuking Prosecutor

By Megan Rosen, Jan. 18, 1:22 p.m. EST

THE TAKING


Federal Land Seizures and the Border Fence

Standard

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LABASH: Drone-Assisted Fishing Is Real, and It's Pathetic

It's not as far as you think it should be completely outlawed, but I was a situational libertarian. I'm against the government ever interfering in my freedom, but I don't really push in the interest of unbridled ego, or ego with others. So I will go as far as to say that drones should be completely outlawed from operating anywhere near me. Especially while I'm fishing.




AXIOS

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The insane news cycle of Trump's presidency in 1 chart

If it feels like the Trump presidency has been hit by non-stop scandals and crises from day one, it's probably because it has been. The Google News Lab looked at the search trends for stories about one of the biggest news events of Trump's presidency from Jan. 20 until Sept. 1. You can see how we've all jumped from one four-hour news cycle to another.



FiveThirtyEight

Politics | Sports | Science & Health | Economics | Culture

7 Ways To Redistrict The Entire Freakin' Country — From Fair To Heavily Gerrymandered

By Aaron Bayette, Ella Kosar, David Wasserman and Julia Varley

How Popular Is Donald Trump?

UPDATED 47 MINUTES AGO

55.9% Disapprove

39.2% Approve

NFL Predictions

UPDATED JAN. 21, 2018

New England 56%

Philadelphia 42%

Vox

EXPLAINERS | POLITICS & POLICY | WORLD | CULTURE | SCIENCE & HEALTH | IDENTITIES | MORE

Activists got Democrats to shut down the government. Can they do it again?

"We don't see it": Activists don't think Democrats won the shutdown fight.

3 potential problems for an obstruction of justice case against Trump

Why some experts think Mueller would need a lot more to make a case.

20 years ago, Dawson's Creek introduced a love triangle that changed teen soaps forever

It's not a good show, but it did one thing right.

THE WALL STREET JOURNAL

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Trump Says He Is Willing to Testify to Mueller Under Oath

President Trump said he was willing to be interviewed under oath in special counsel Robert Mueller's "investigation into Russian interference in the 2016 election," according to a source familiar with the president's plans.

White House's Infrastructure Push Targets 'Pork' Bill

House Republicans are working to pass a bill that would allow the president to spend money on infrastructure projects.

Airlines Are Hoping the Benefits of Strong Travel Demand

The downturn in the price of oil is a boon for airlines.

FINANCIAL TIMES

WORLD BUSINESS NEWSPAPER

Downfall How the high-flying boss of China's Anbang fell foul of the ruling party

— BIG READ PAGE 9

Dozens die on Gaza border as US and Israel mark embassy opening

Dozens of Palestinian teens killed and scores more injured as Israeli forces on the Gaza border opened fire on protesters against the inauguration of the US embassy in Jerusalem.



Berliner Morgenpost

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SCHWERER UNFALL

Zehnjährige in Brandenburg von Laster überrollt



Meistgelesene Artikel

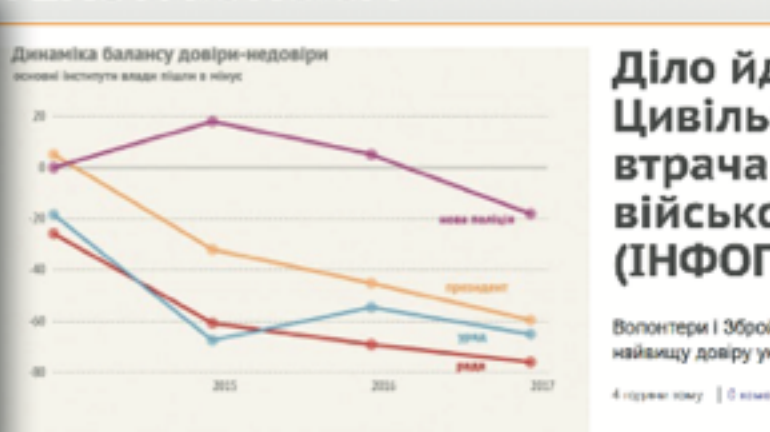
- SCHWERER UNFALL 25.01.2018
Zehnjährige in Brandenburg von Laster überrollt
- VERÖFFENTLICHUNG 25.01.2018
Bundestag nennt AfD-Politiker Björn Höcke „Bemd“
- DREIFACHER BAHN 25.01.2018
Zwei neue Bahnstationen für den Berliner Süden
- LANGJÄHRIGE DEBATTE 25.01.2018
Pferdekutschen am

ТЕКСТИ.ORG.UA

НАШІ ІНТЕРАКТИВНІ ВІЗУАЛІЗАЦІЇ

Діло йде до хунти. Цивільні органи влади втрачають довіру, військові нарощують (ІНФОГРАФІКА)


Волонтери і Збройні сили України вже традиційно отримують найвищу довіру українського суспільства, читали ви раніше?



ZEITUNG ONLINE

politics | society | economy | Culture | Knowledge | Digital campus | job | Discover | Sports | time Magazine

A question of credibility



Martin Schulz loses recognition in the SPD. He has excluded entry to the cabinet Merkel. Can he still become vice-chancellor?

Common misconceptions

1. “A picture is worth a thousand words”
2. “Visualization is intuitive”
3. “The data should speak for itself”
4. “Show, don’t tell!”

Common misconceptions

1. “A picture is worth a thousand words”
2. “Visualization is intuitive”
3. “The data should speak for itself”
4. “Show, don’t tell!”

IF YOU
KNOW
HOW TO
READ IT

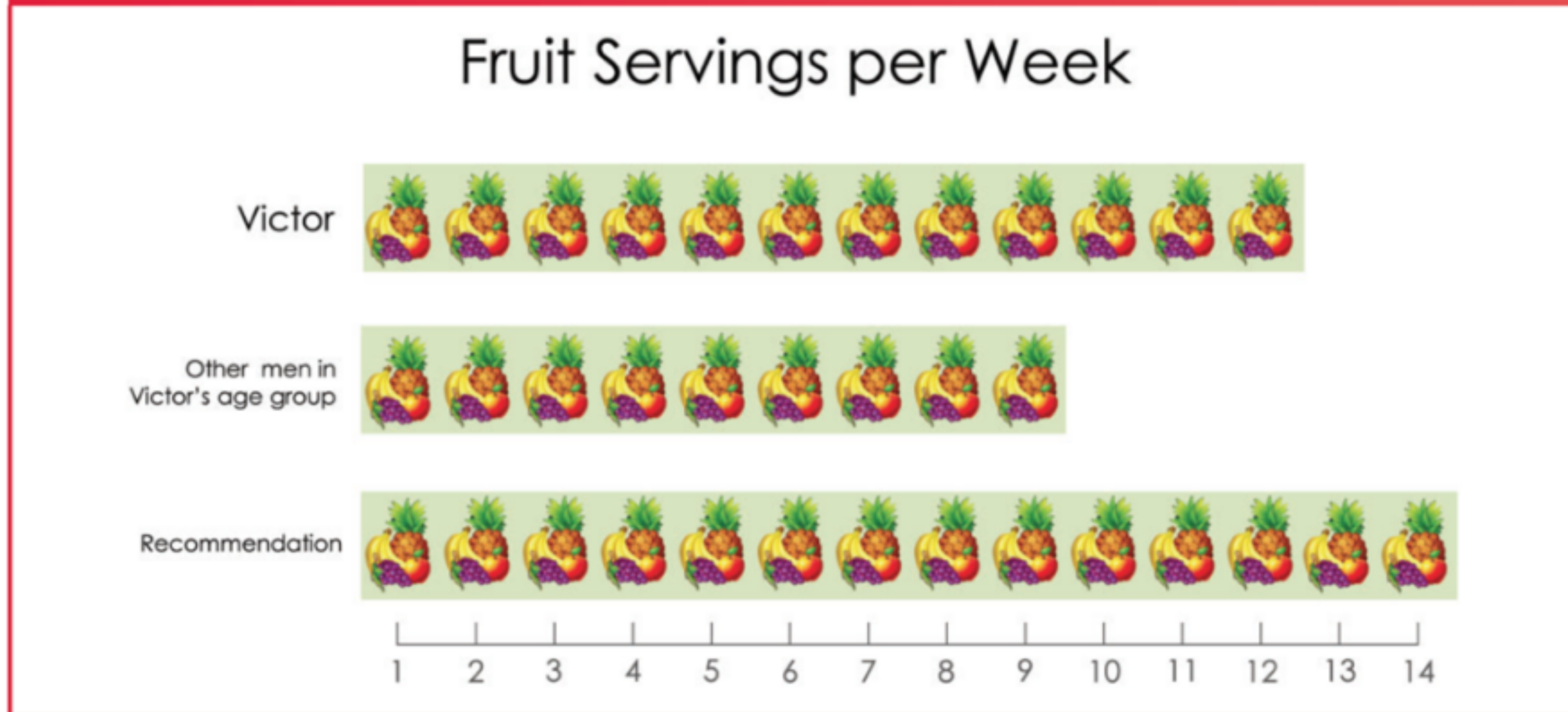


Visuals are often ambiguous



Visuals are often ambiguous

Figure 1: Infographic of Victor's fruit serving consumption per week as compared to that of other men in his age group and to the minimum recommended servings.



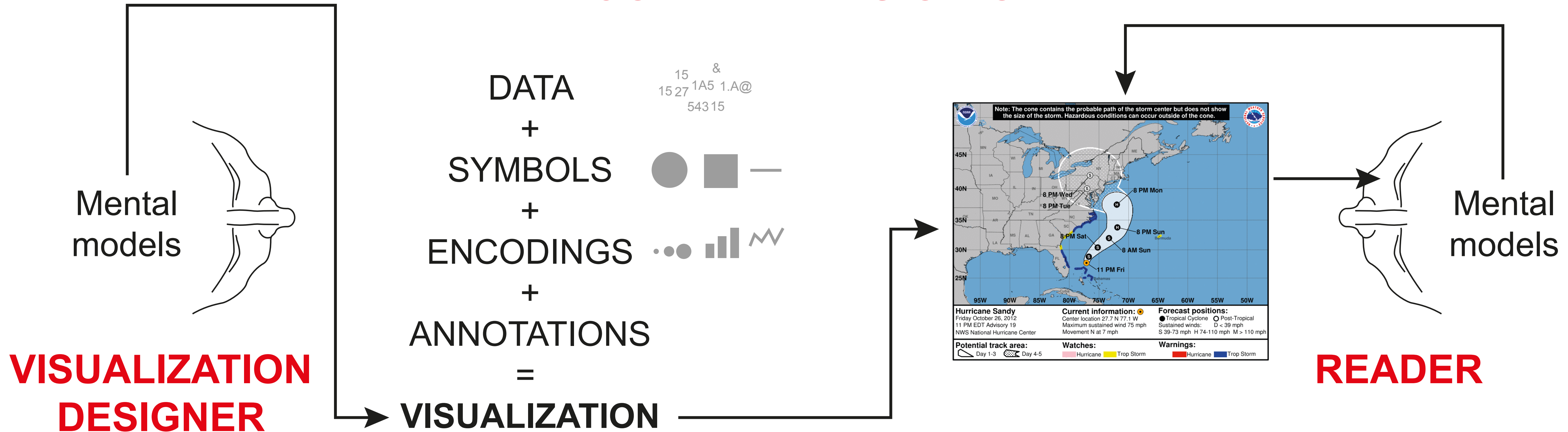
Arcia, A. et. al. "Sometimes More Is More: Iterative participatory design of infographics for engagement of community members with varying levels of health literacy." *Journal of the American Medical Informatics Association*. Jan;23(1):174-83. doi: 10.1093/jamia/ocv079. Epub 2015 Jul 13.

Challenges to overcome

Challenge 1

LACK OF SHARED MENTAL MODELS

THE COMPREHENSION GAP





Note: The cone contains the probable path of the storm center but does not show the size of the storm. Hazardous conditions can occur outside of the cone.



Subtropical Storm Alberto
 Friday May 25, 2018
 10 AM CDT Advisory 1
 NWS National Hurricane Center

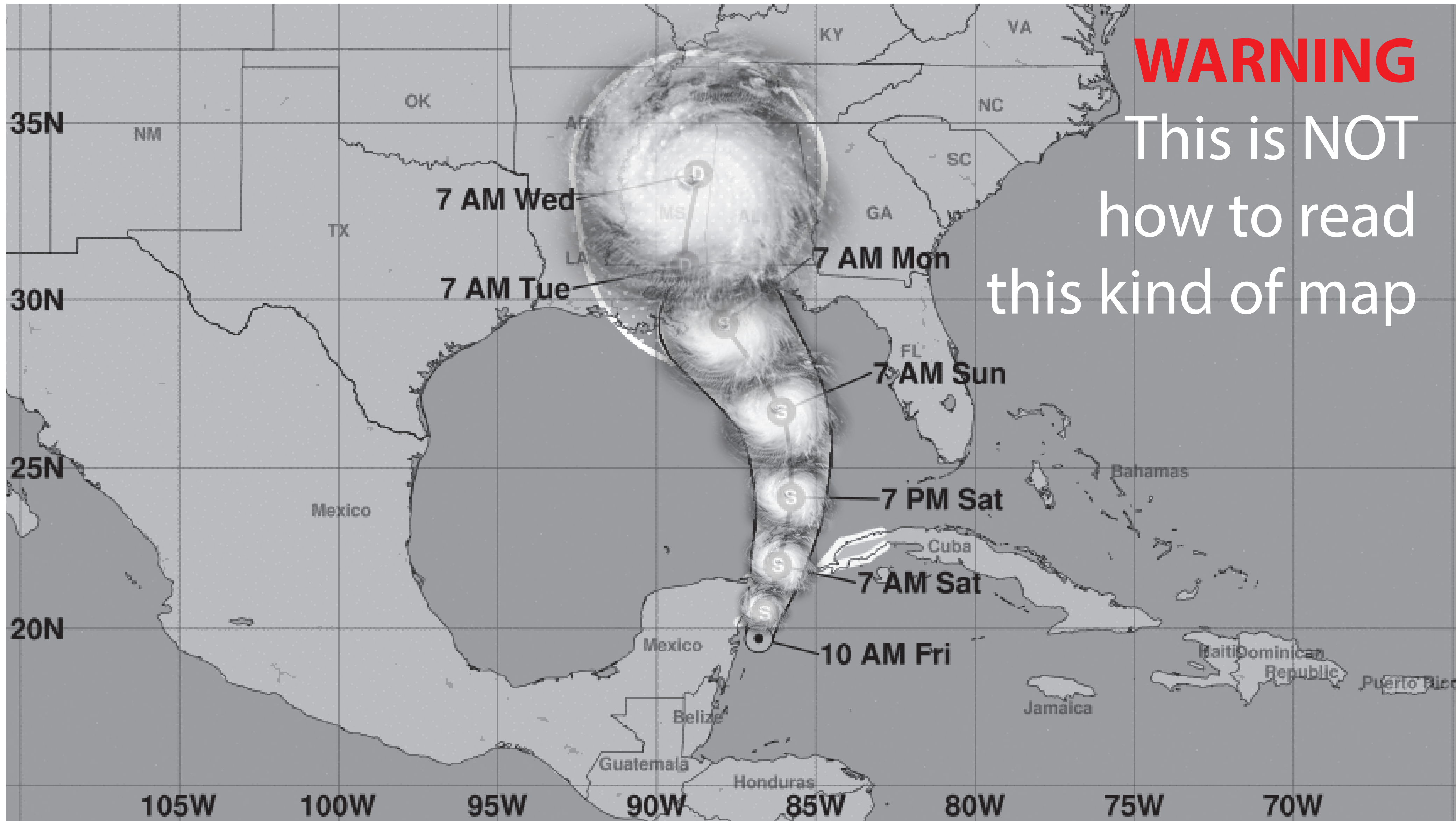
Current information: ●
 Center location 19.7 N 86.8 W
 Maximum sustained wind 40 mph
 Movement NNE at 6 mph

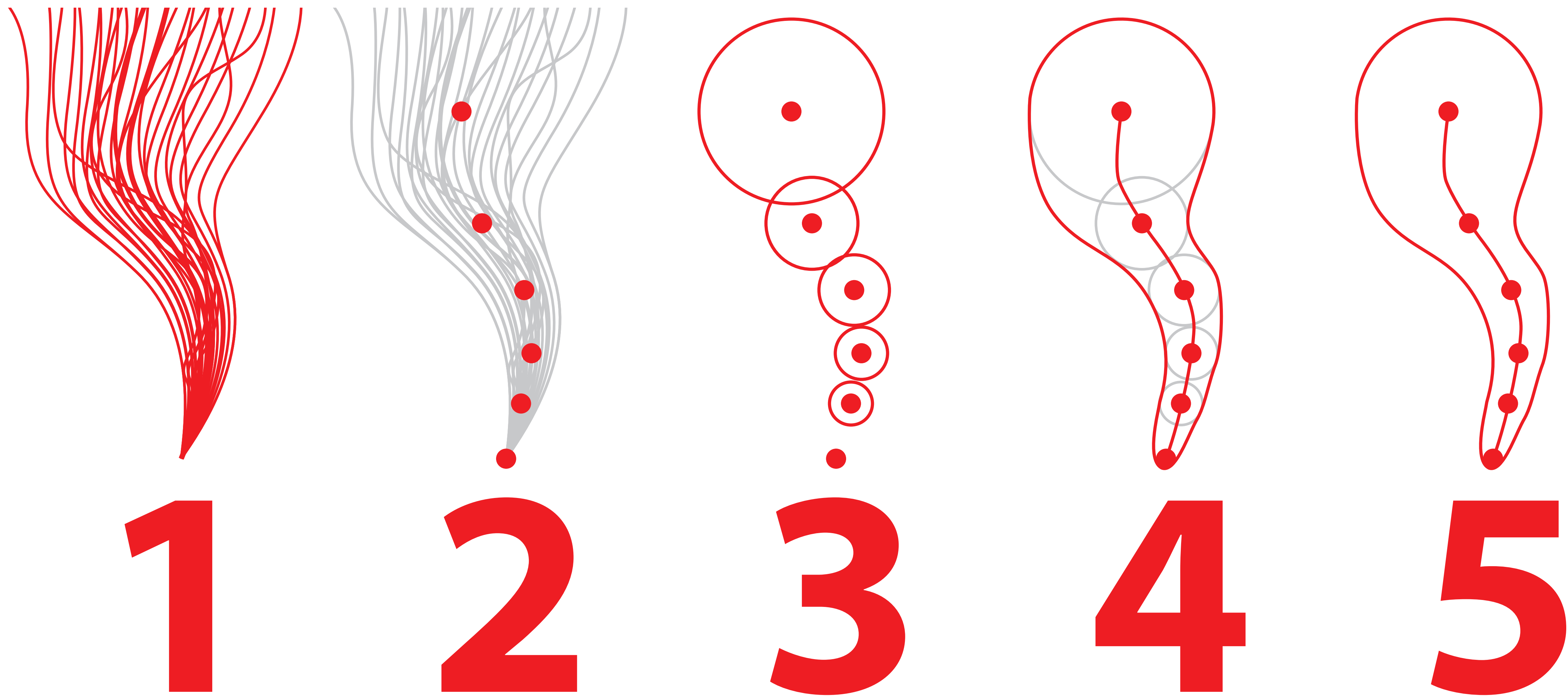
Forecast positions:
 ● Tropical Cyclone ○ Post/Potential TC
 Sustained winds: D < 39 mph
 S 39-73 mph H 74-110 mph M > 110 mph

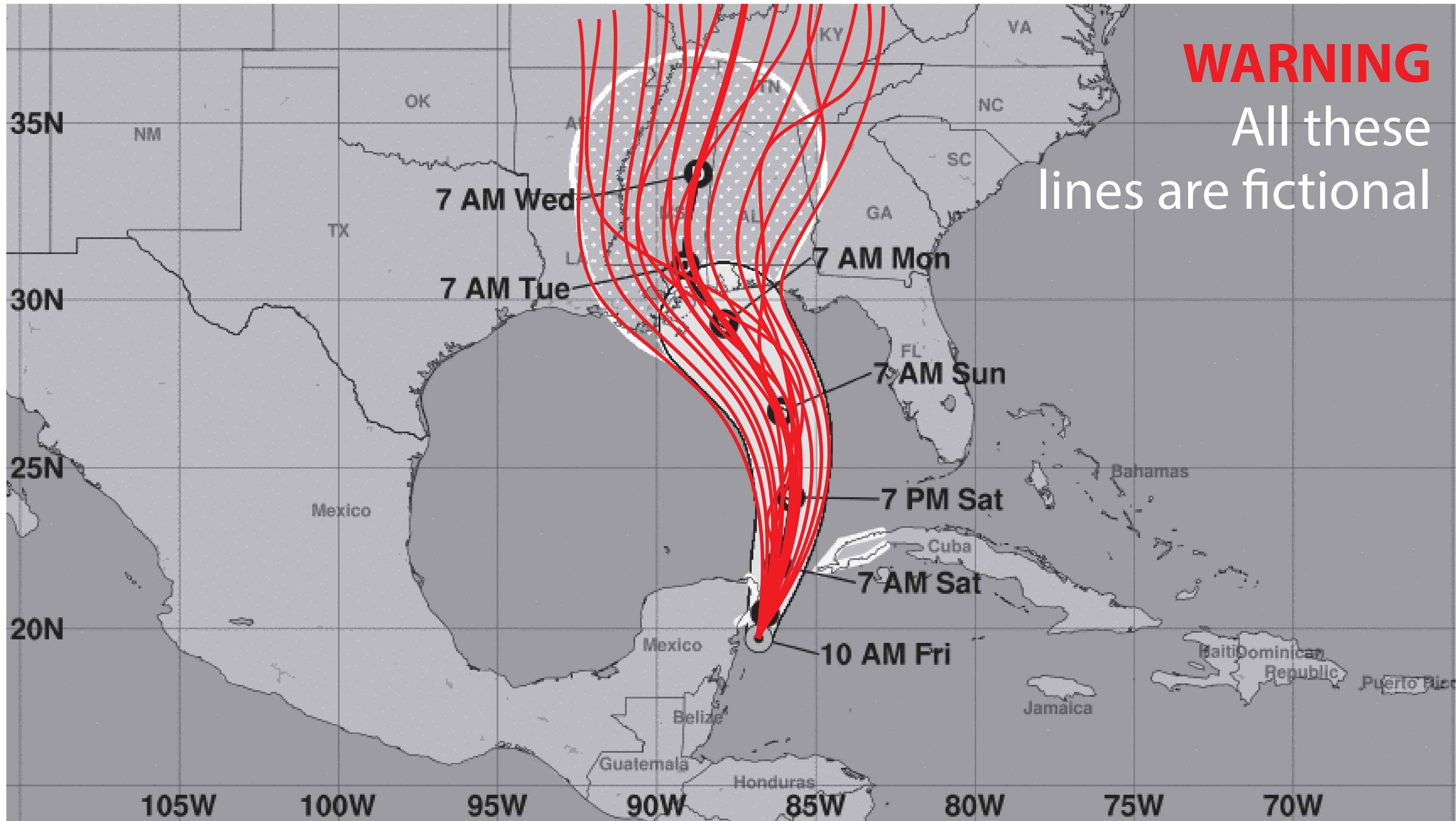
Potential track area:
 ▽ Day 1-3 ▨ Day 4-5

Watches:
 ■ Hurricane ■ Trop Storm

Warnings:
 ■ Hurricane ■ Trop Storm

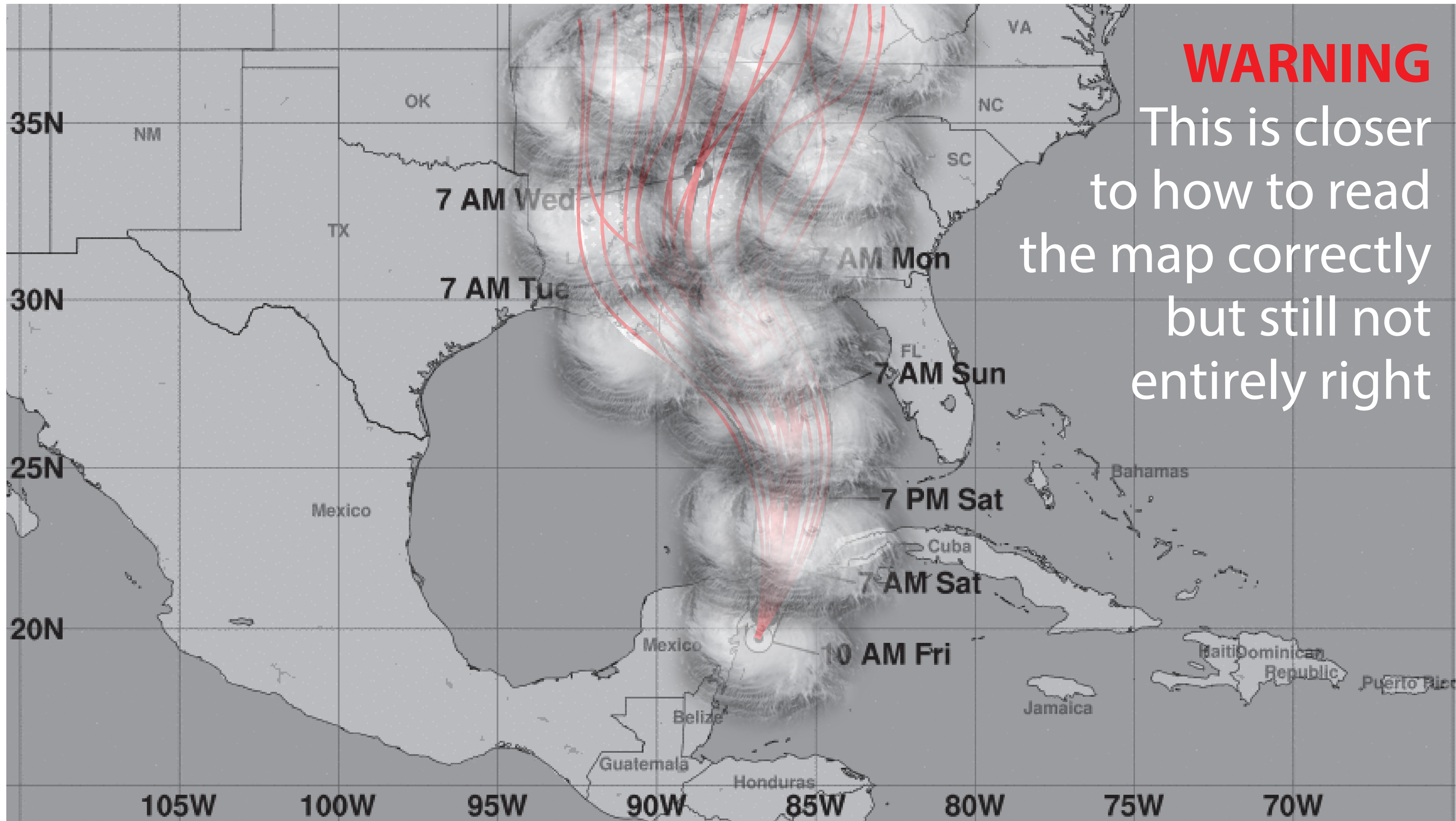


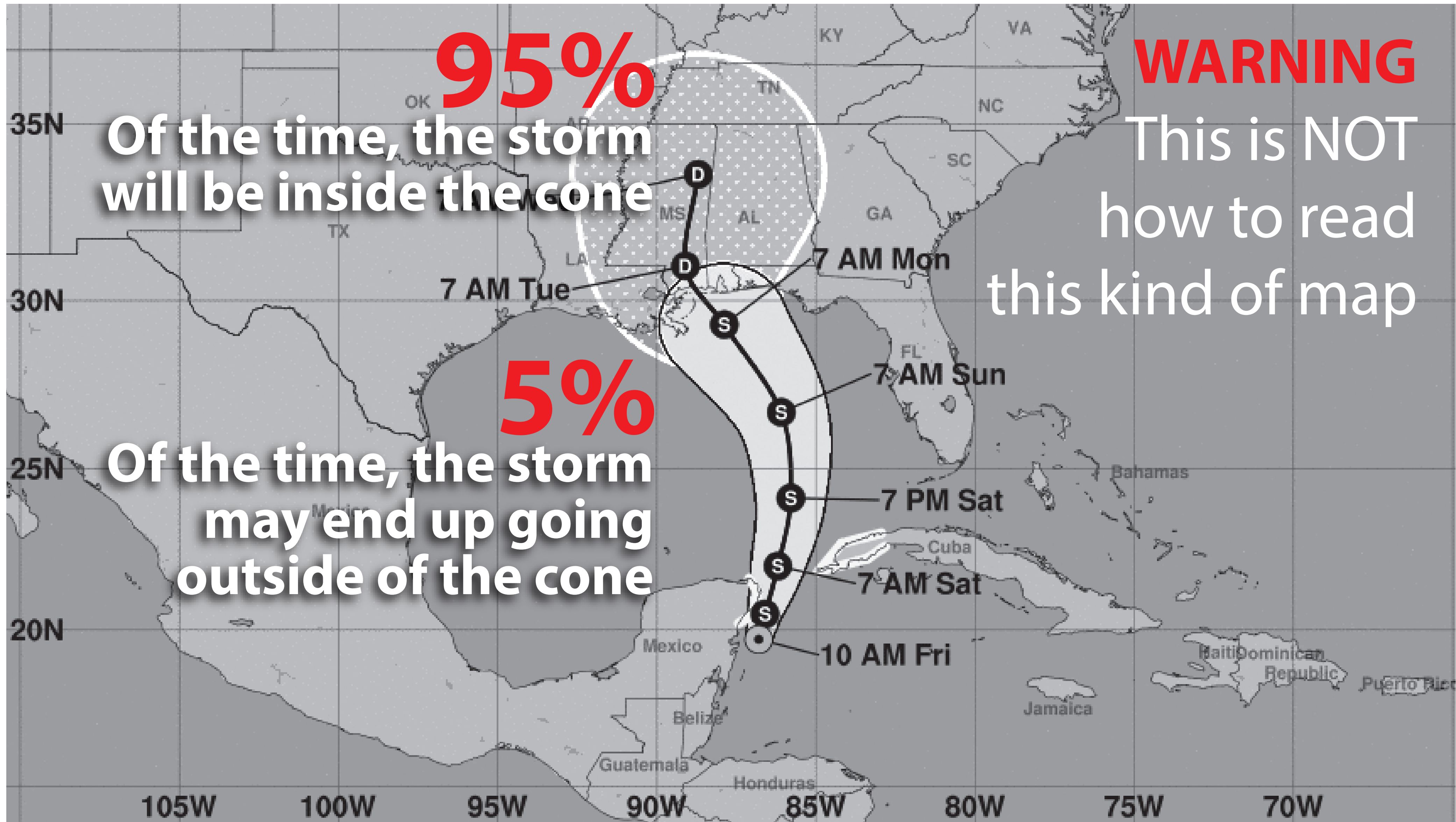


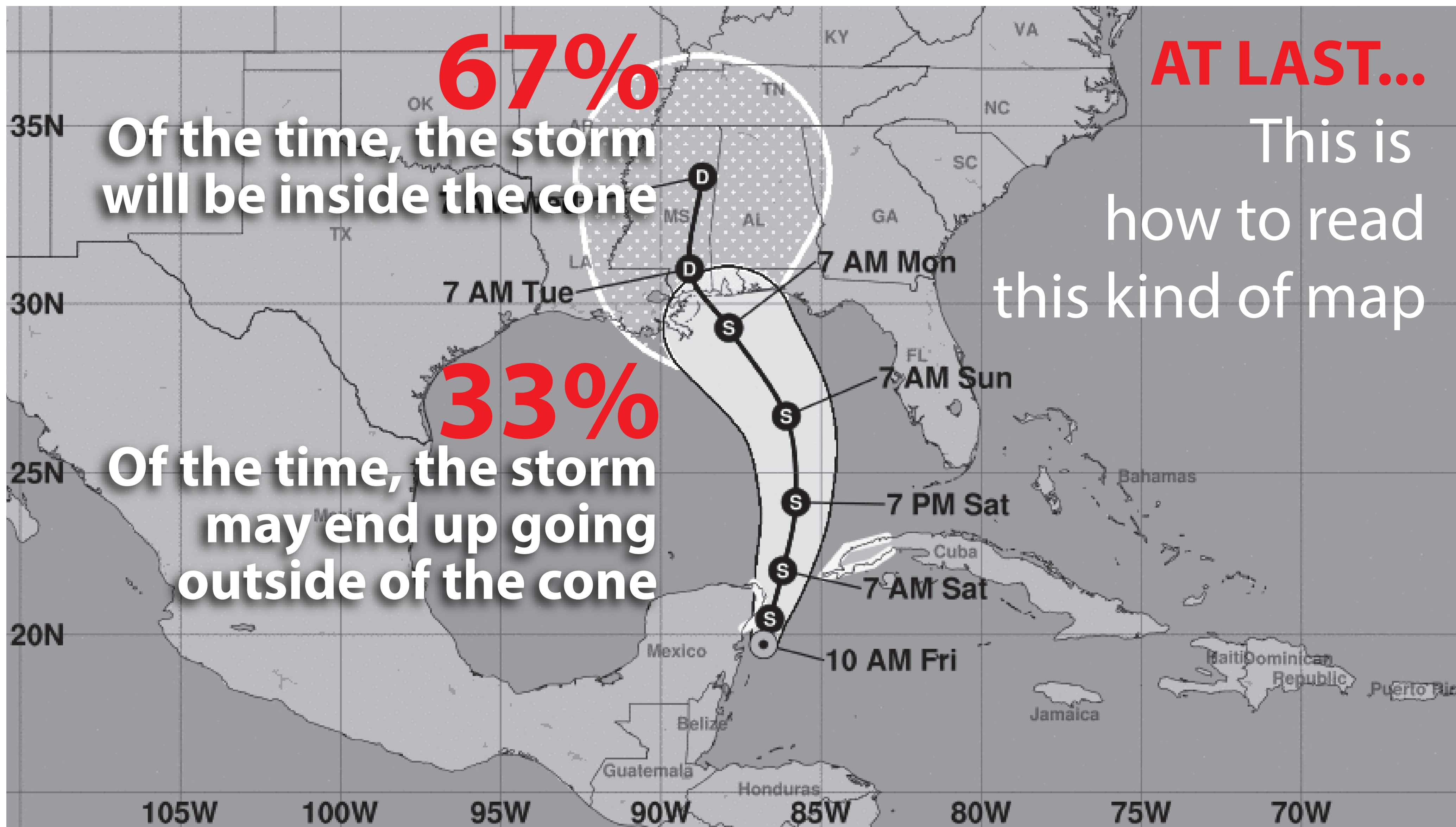


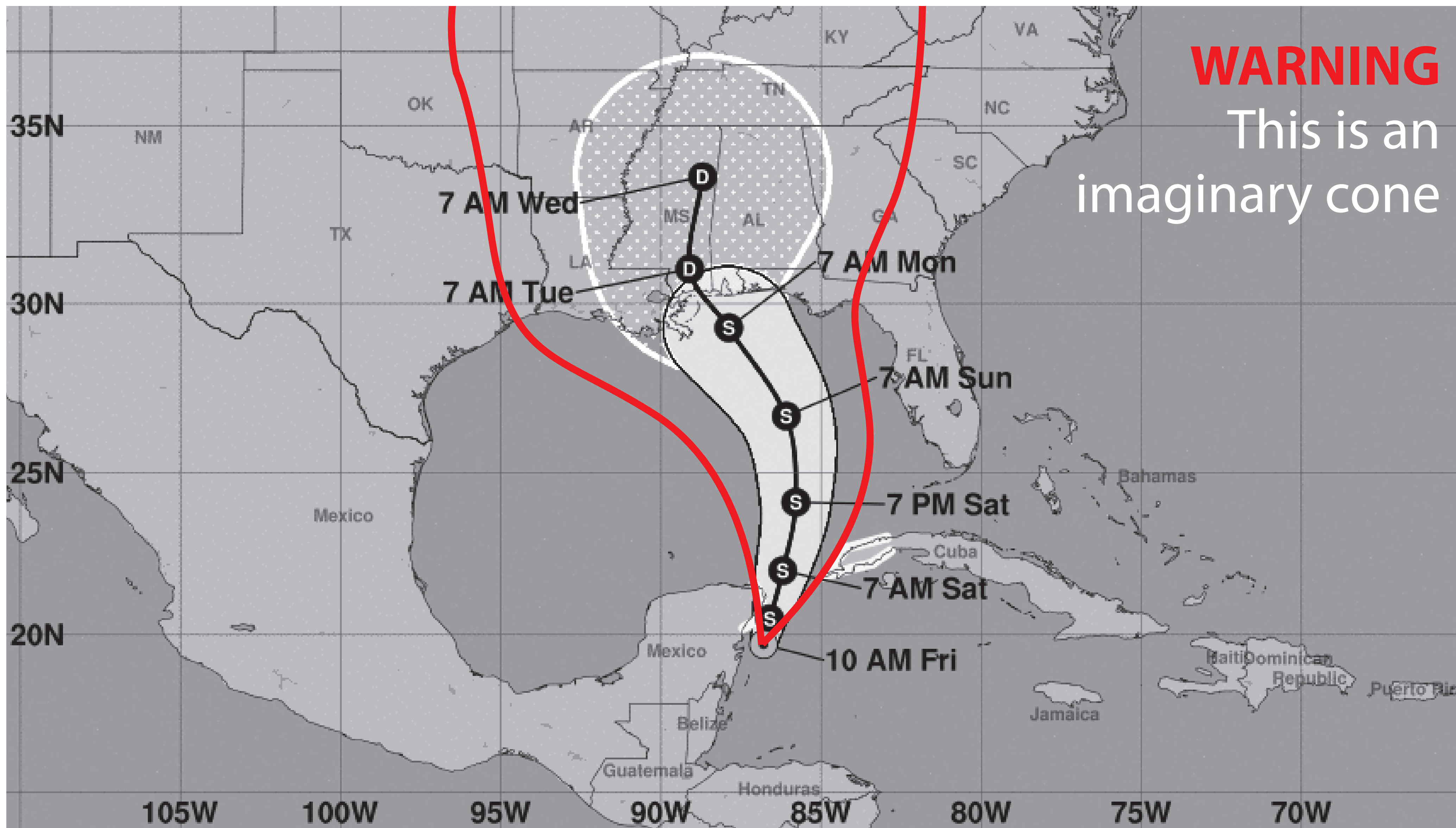
WARNING

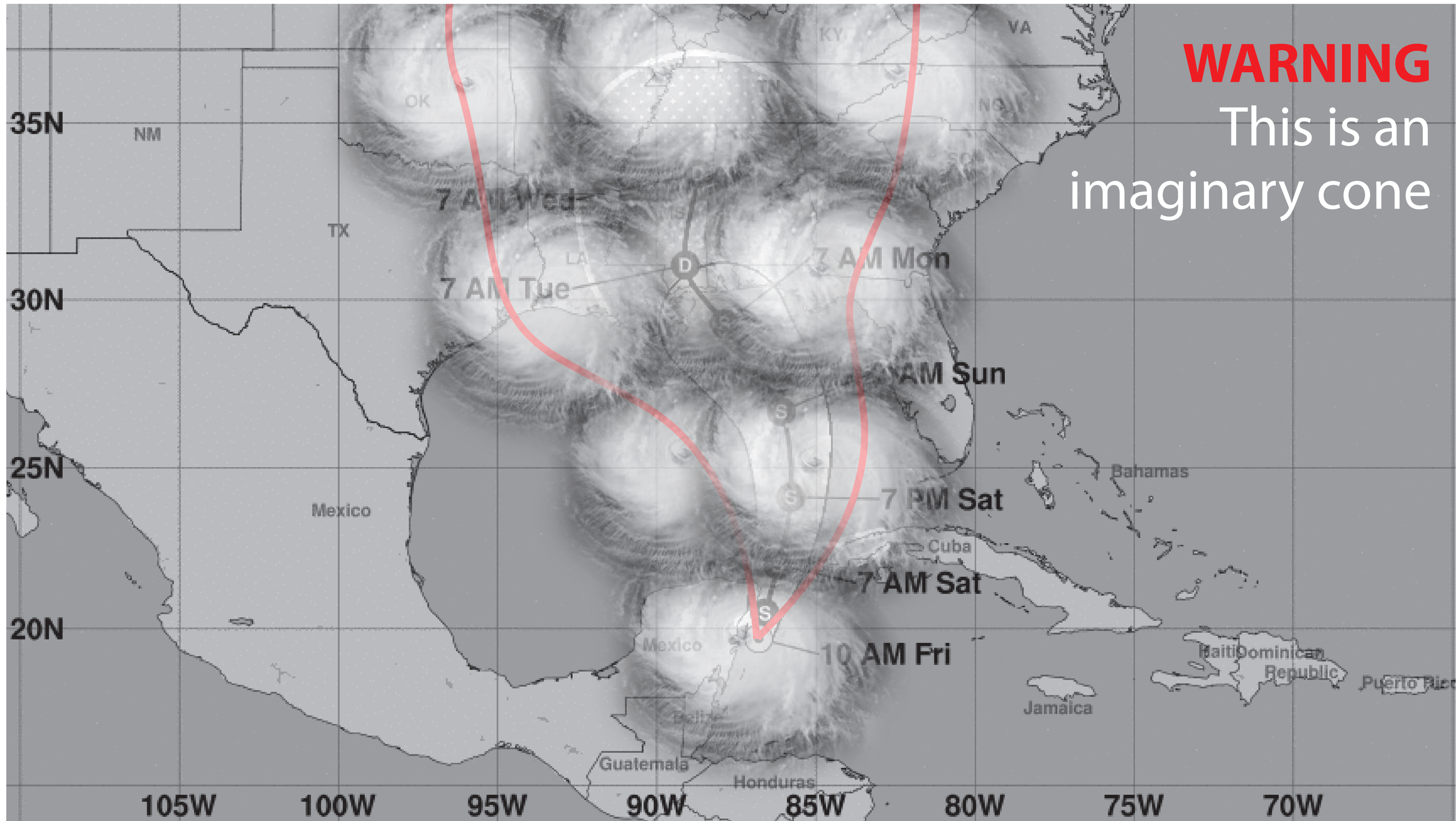
All these lines are fictional











WARNING

This is an
imaginary cone

Challenges to overcome

Challenge 2

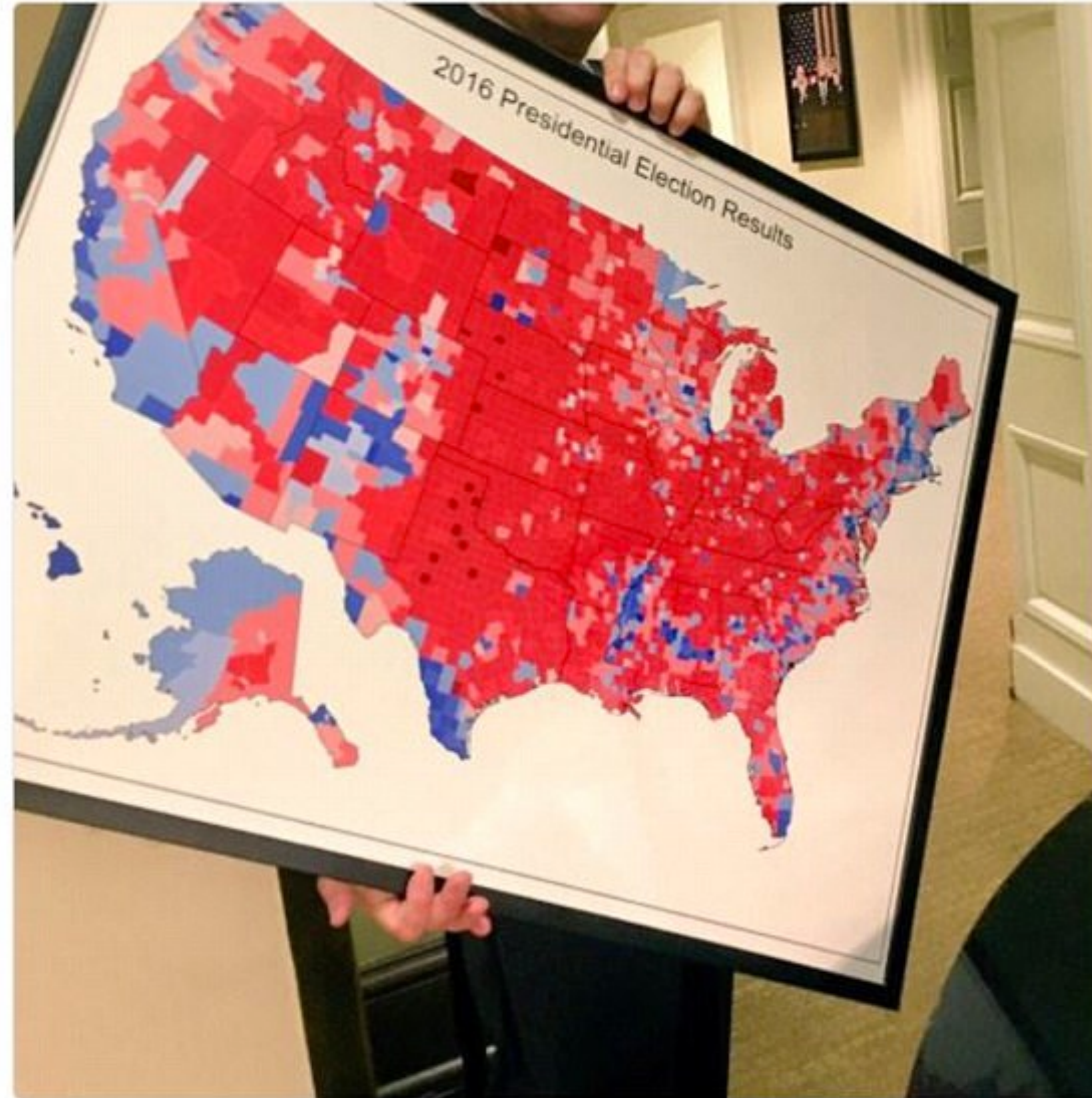
CONFIRMATION

We constantly see patterns. Once we identify patterns that look meaningful—even if they are just the product of randomness—our brains try to connect them with causal links and shape them as stories. Then, we strive to confirm them, never to challenge them



Trey Yingst [@TreyYingst](#) · May 11

Spotted: A map to be hung somewhere in the West Wing



https://twitter.com/TreyYingst?ref_src=twsrc%5Egoogle%7Ctwcamp%5Eserp%7Ctwgr%5Eauthor



Gideon Resnick  @GideonResnick · 32m

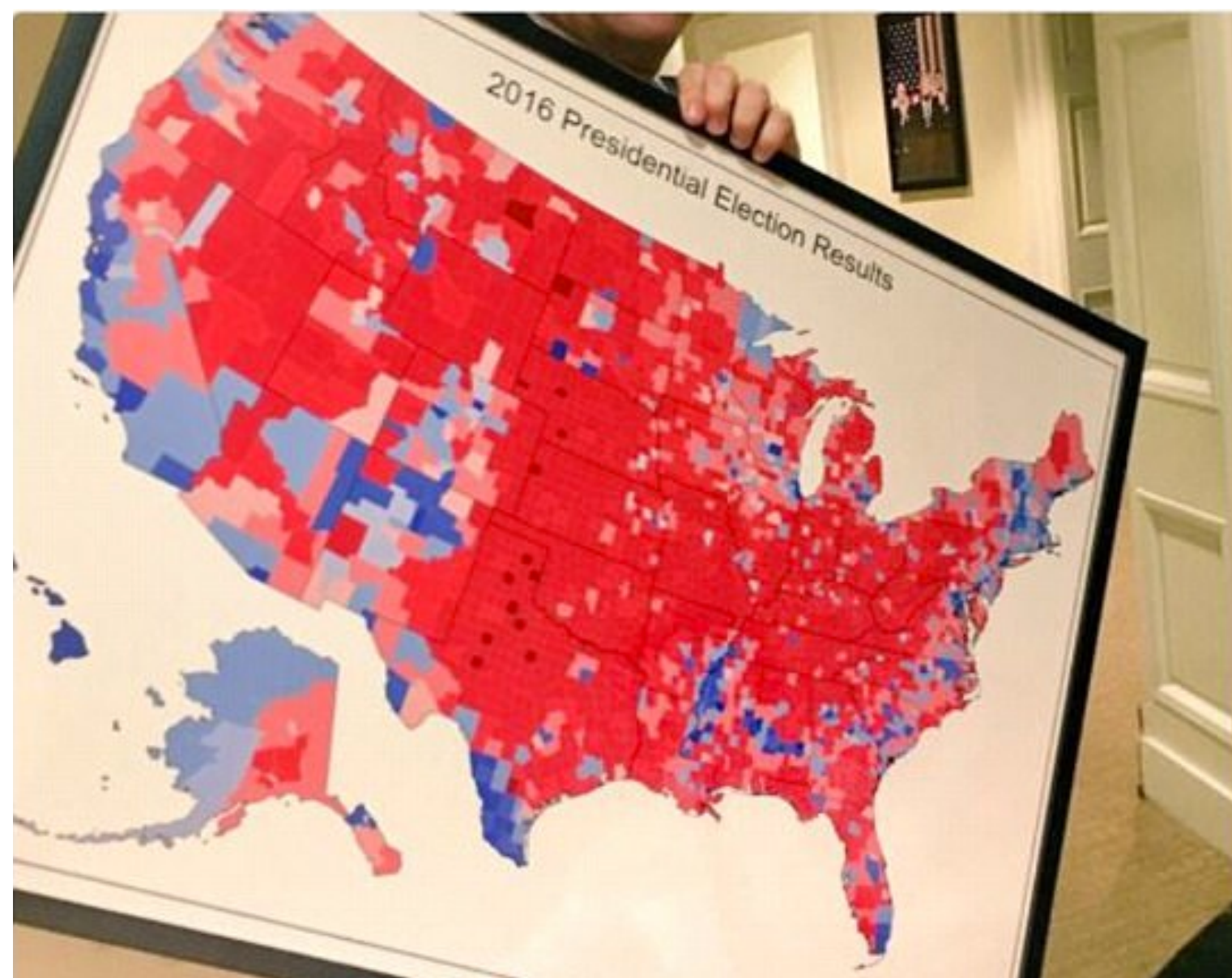
here's a pic from reuters of Trump with the electoral maps he showed to reporters yesterday



“Here, you can take that, that’s the final map of the numbers,” the Republican president said from his desk in the Oval Office, handing out maps of the United States with areas he won marked in red. “It’s pretty good, right? The red is obviously us.”

Stephen J. Adler, Steve Holland and Jeff Mason

<https://www.reuters.com/article/us-usa-trump-100days/exclusive-trump-says-he-thought-being-president-would-be-easier-than-his-old-life-idUSKBN17U0CA>

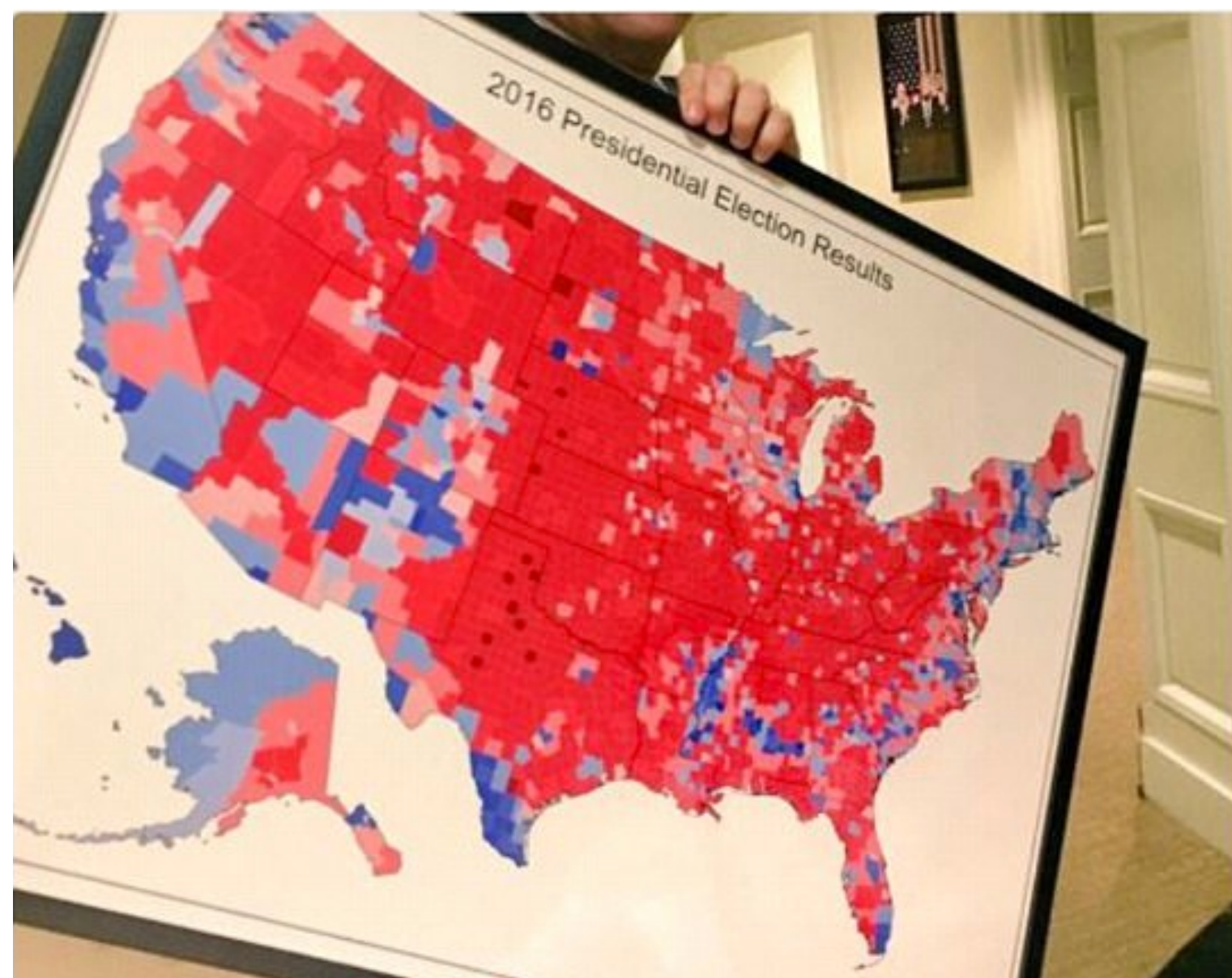


Surface on the
county-level map:

Red: 80%

Blue: 20%

VICTORY BY A LANDSLIDE!!!!!!

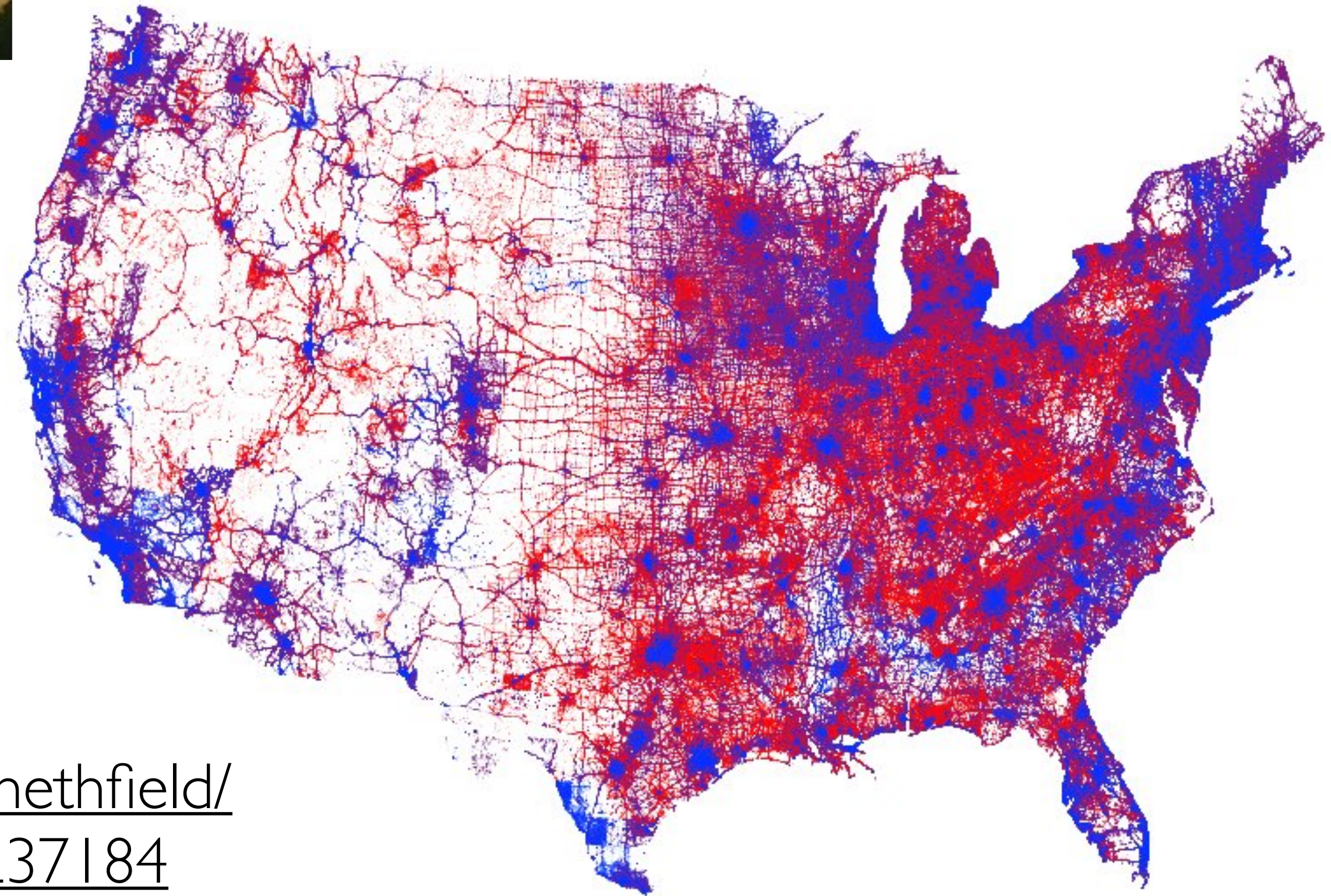


Surface on the
county-level map:

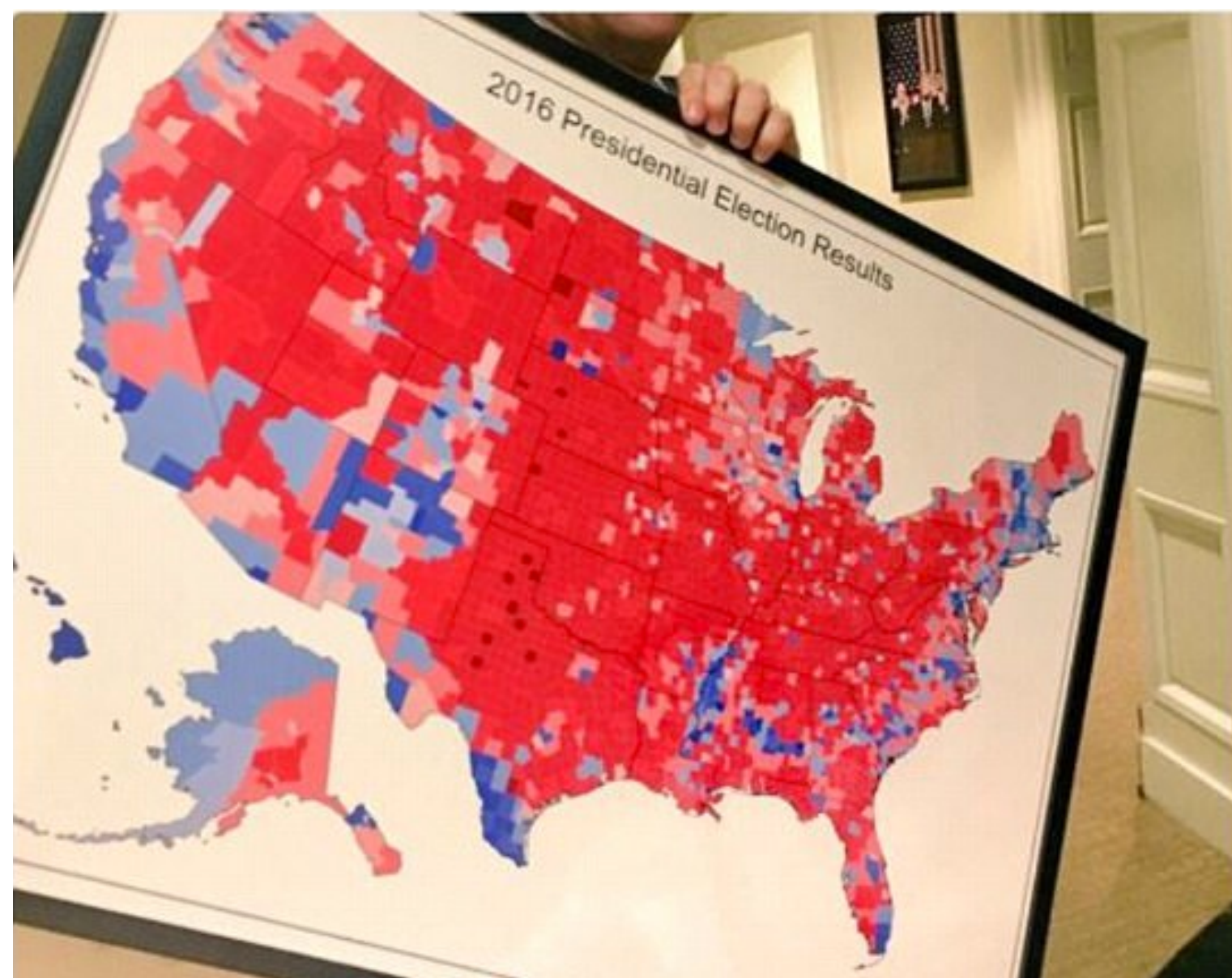
Red: 80%

Blue: 20%

VICTORY BY A LANDSLIDE???



Map by Kenneth Field
[https://twitter.com/kennethfield/
status/970827334038237184](https://twitter.com/kennethfield/status/970827334038237184)



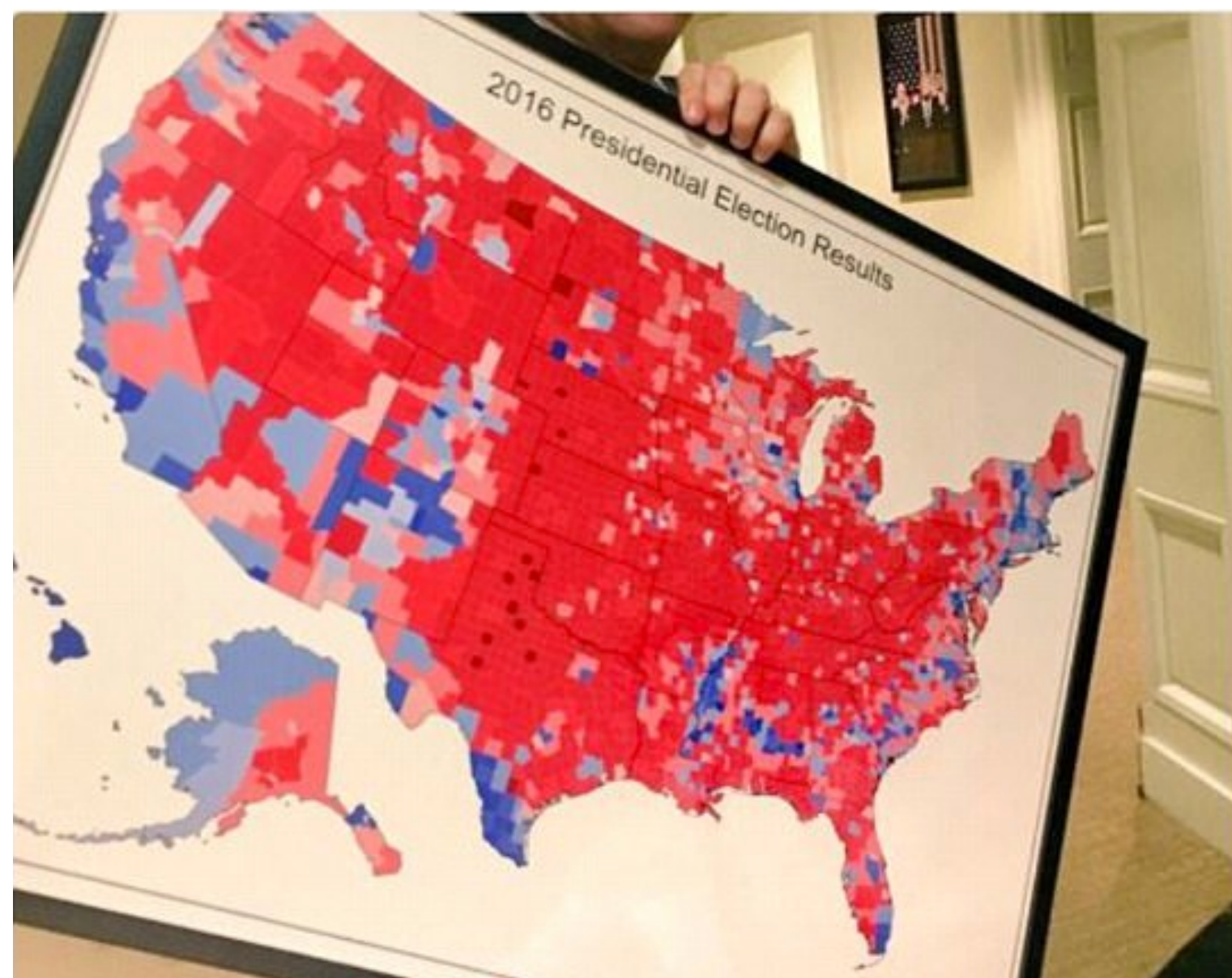
Surface on the
county-level map:

Red: 80%

Blue: 20%

SHARE OF THE POPULAR VOTE IN THE 2016 PRESIDENTIAL ELECTION





Surface on the county-level map:

Red: 80%

Blue: 20%

SHARE OF THE POPULAR VOTE IN THE 2016 PRESIDENTIAL ELECTION



PERCENTAGE OF ELIGIBLE VOTERS



These are the numbers that truly matter in a U.S. Presidential Election

**ELECTORAL
VOTES**

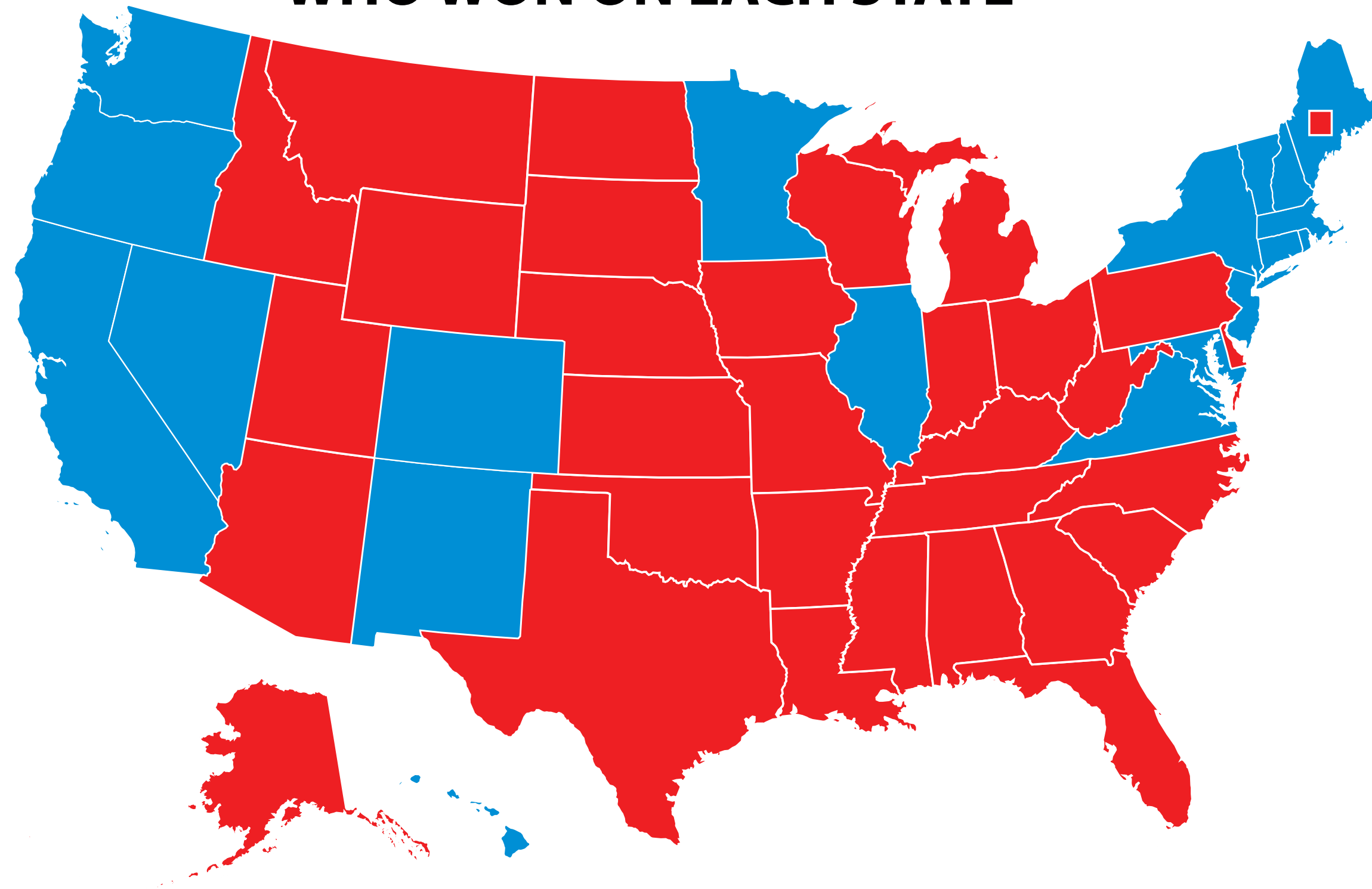
**TRUMP
304**

Other: 7

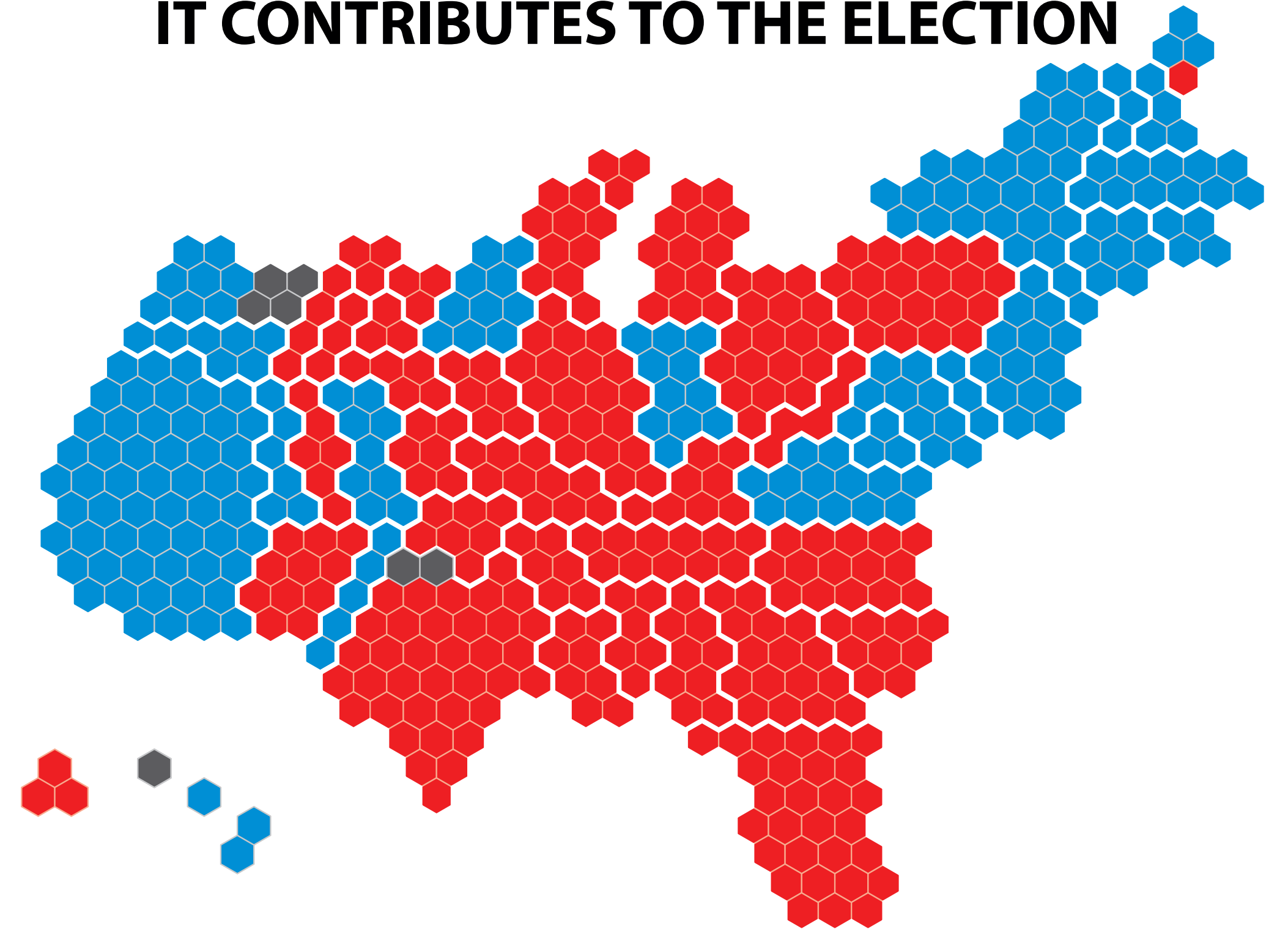
**CLINTON
227**



WHO WON ON EACH STATE



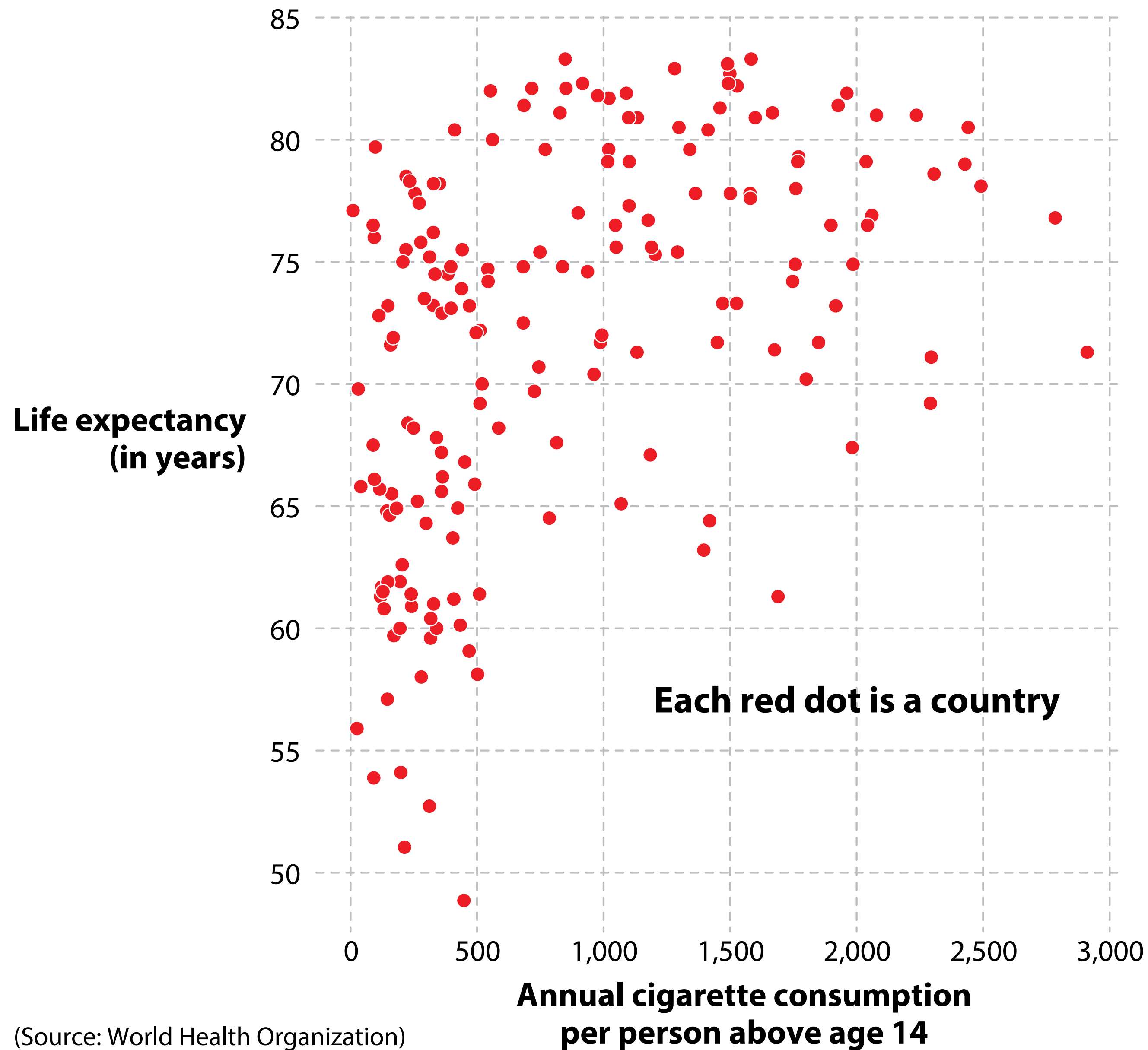
**STATE SIZE ADJUSTED BY ELECTORAL VOTES
IT CONTRIBUTES TO THE ELECTION**



Challenge 3

INCORRECT (MENTAL) DESCRIPTIONS

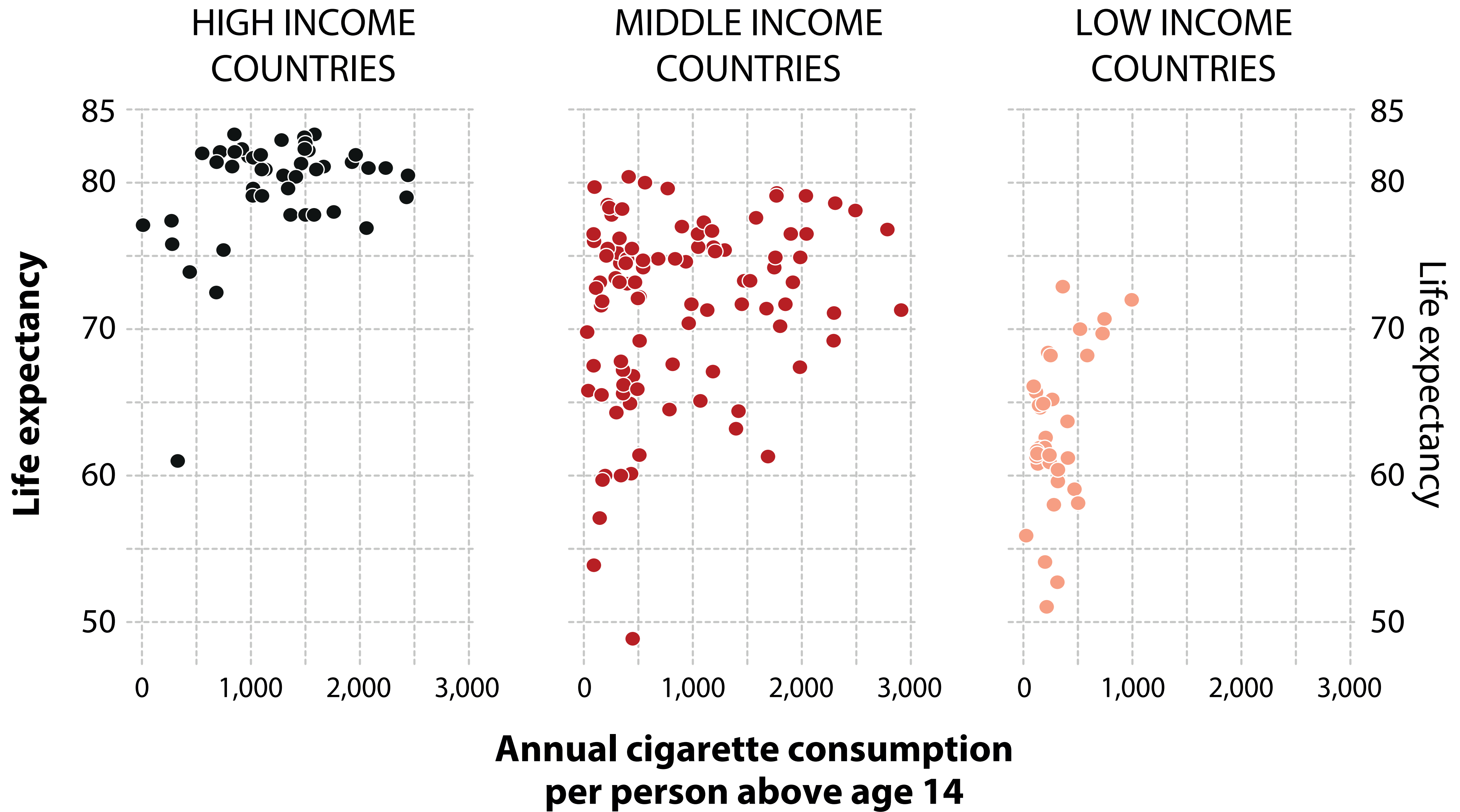
The way we describe the content of a chart to ourselves may bias our understanding of that chart



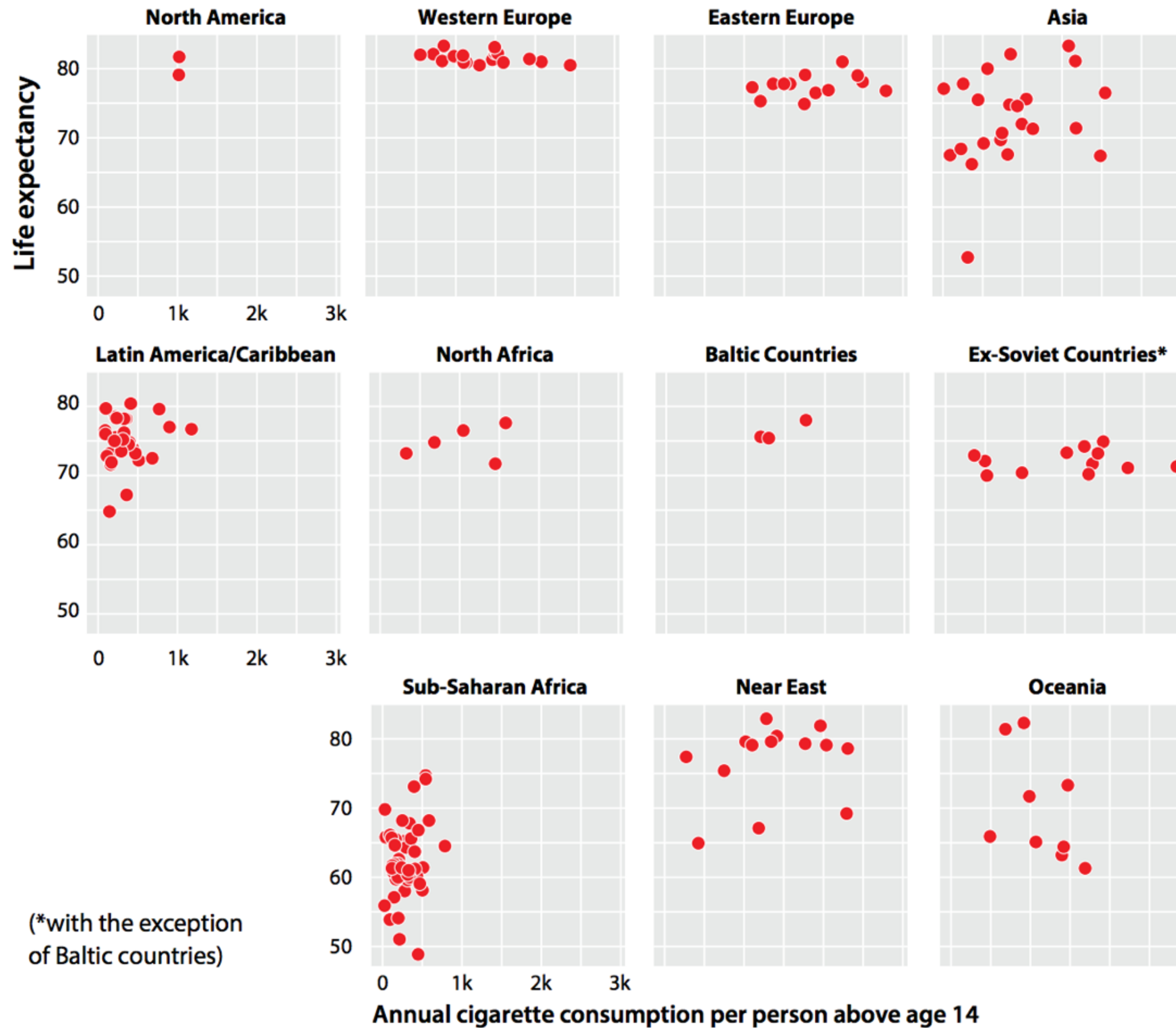
Incorrect verbal descriptions of a chart can greatly bias our understanding of it

Smoking cigarettes can help you live longer!!!

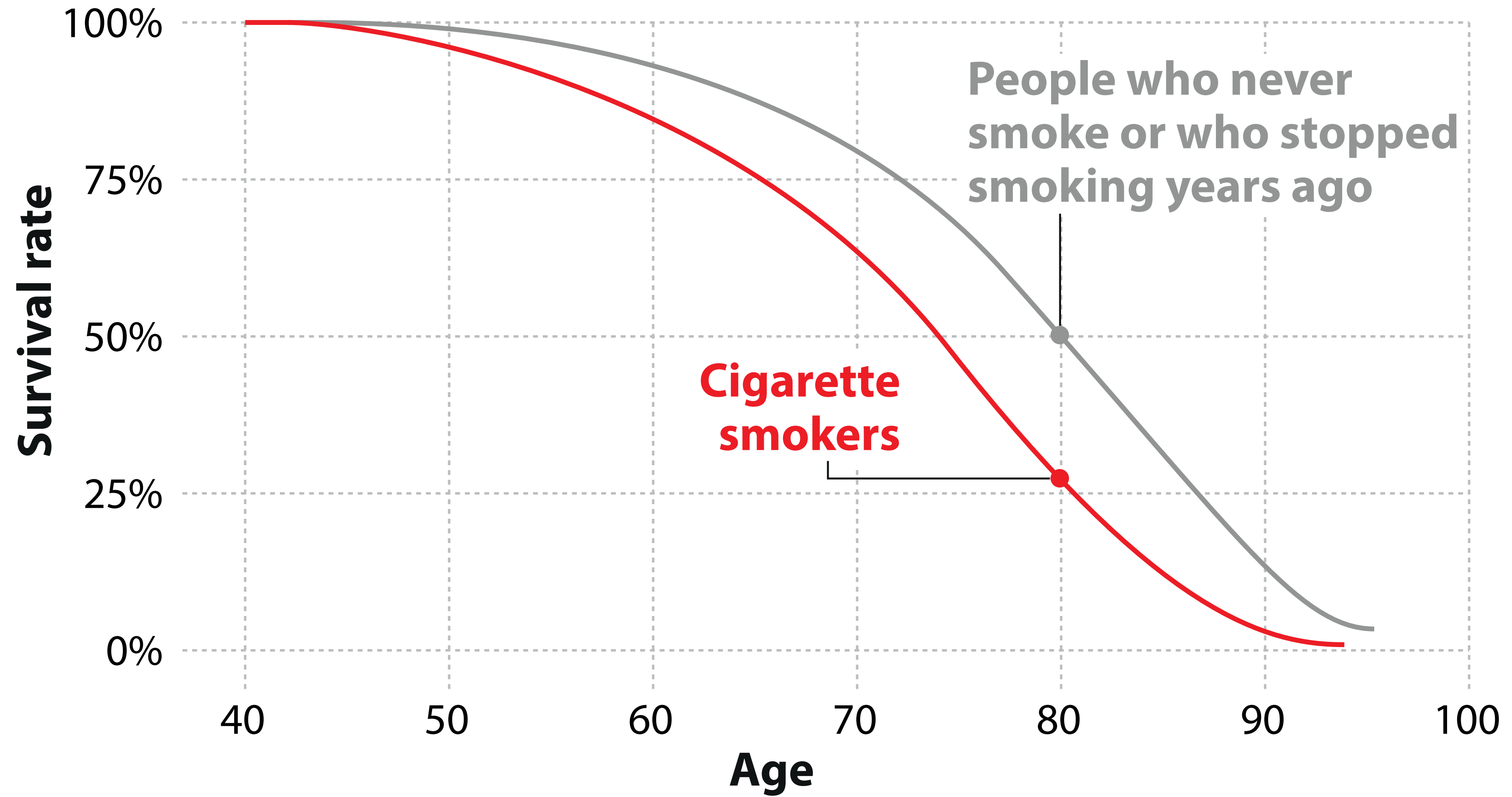
Example provided by Heather Krause
<https://idatassist.com>



Be careful with amalgamation paradoxes and with the ecological fallacy



Be careful with amalgamation paradoxes and with the ecological fallacy

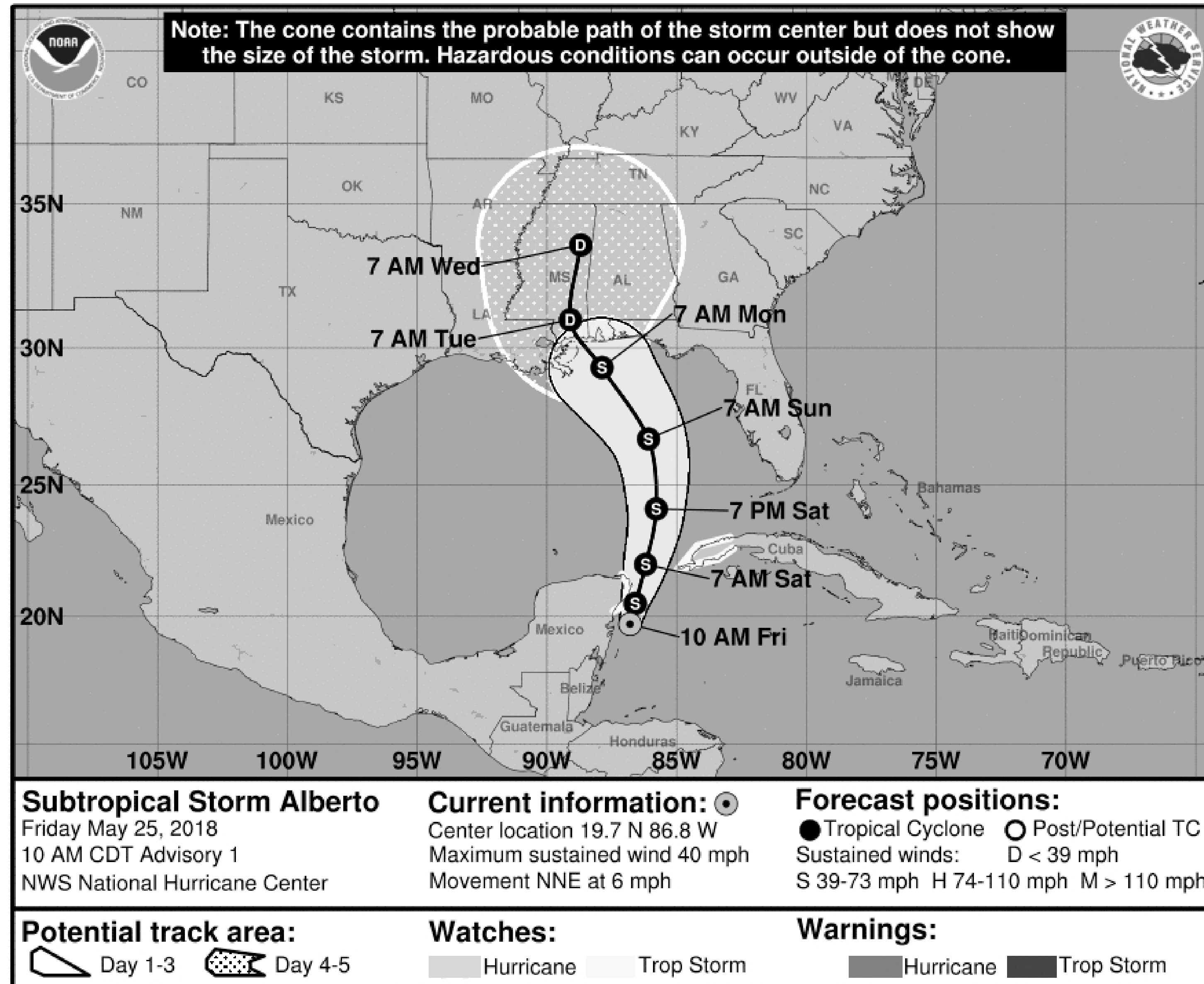


Be careful with amalgamation paradoxes and with the ecological fallacy

WHAT TO DO?

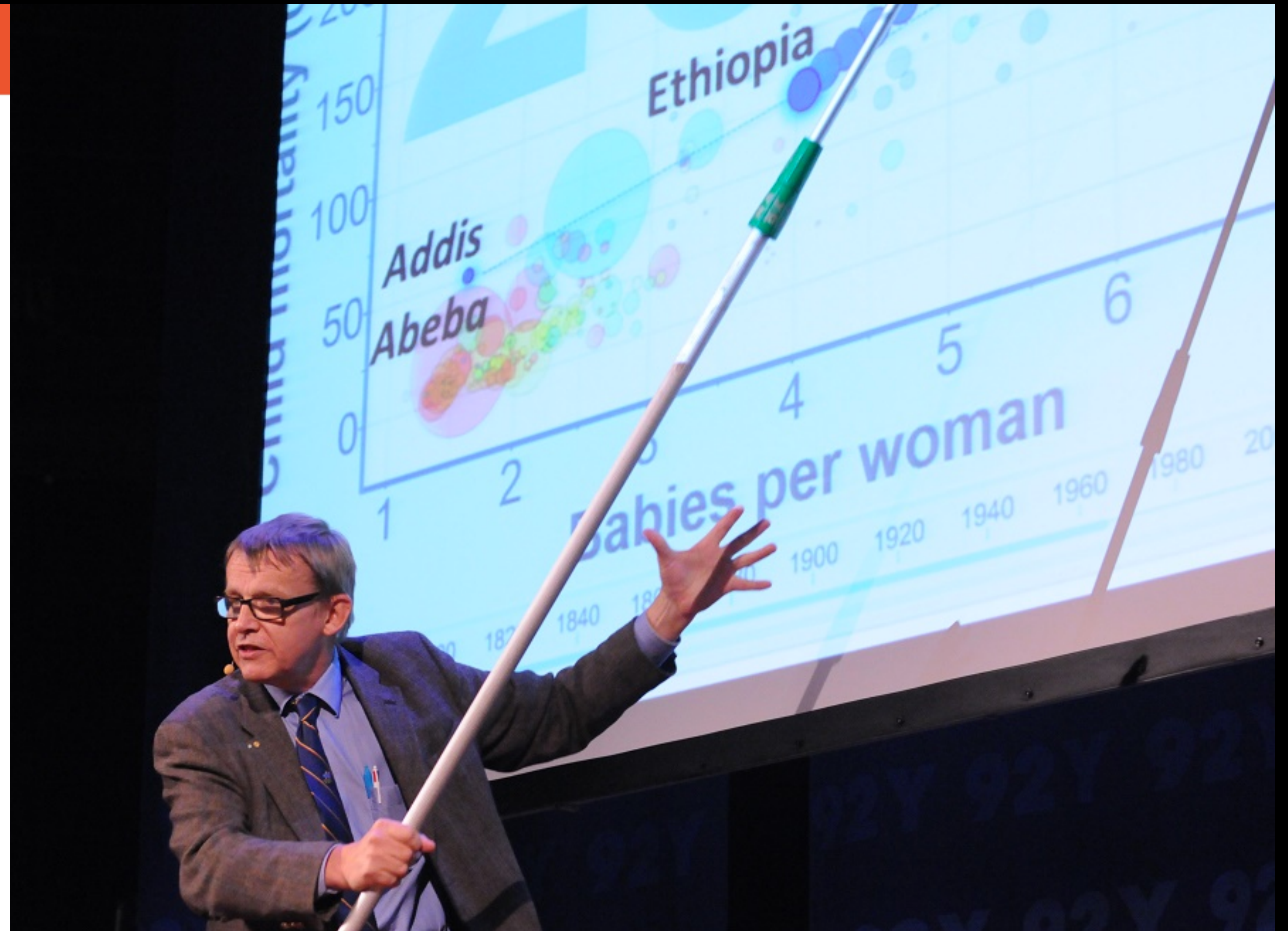
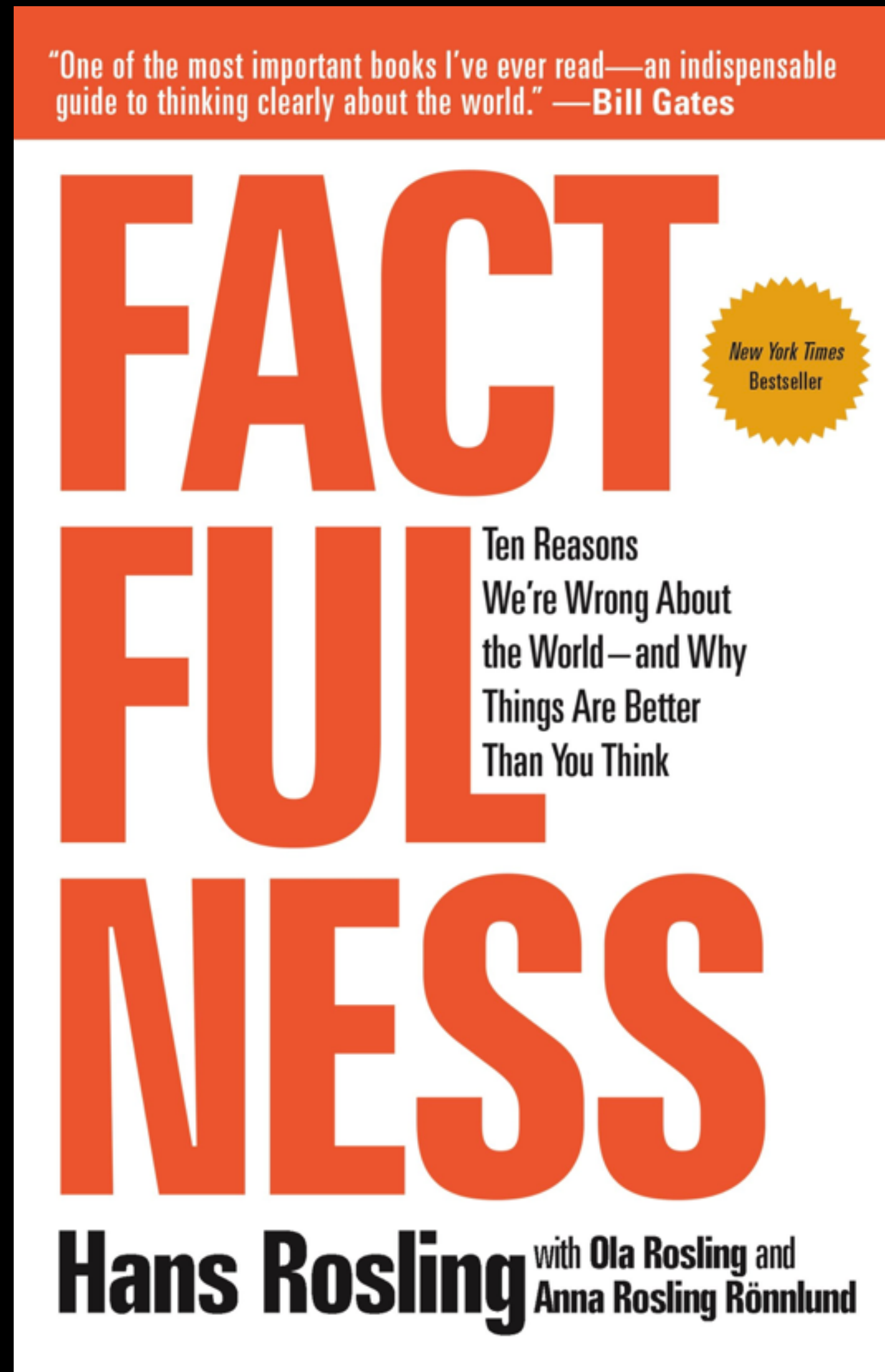
Let's test our graphics more often
with non-experts

If your audience isn't your peers, or if you don't know your audience well,
explain and clarify more



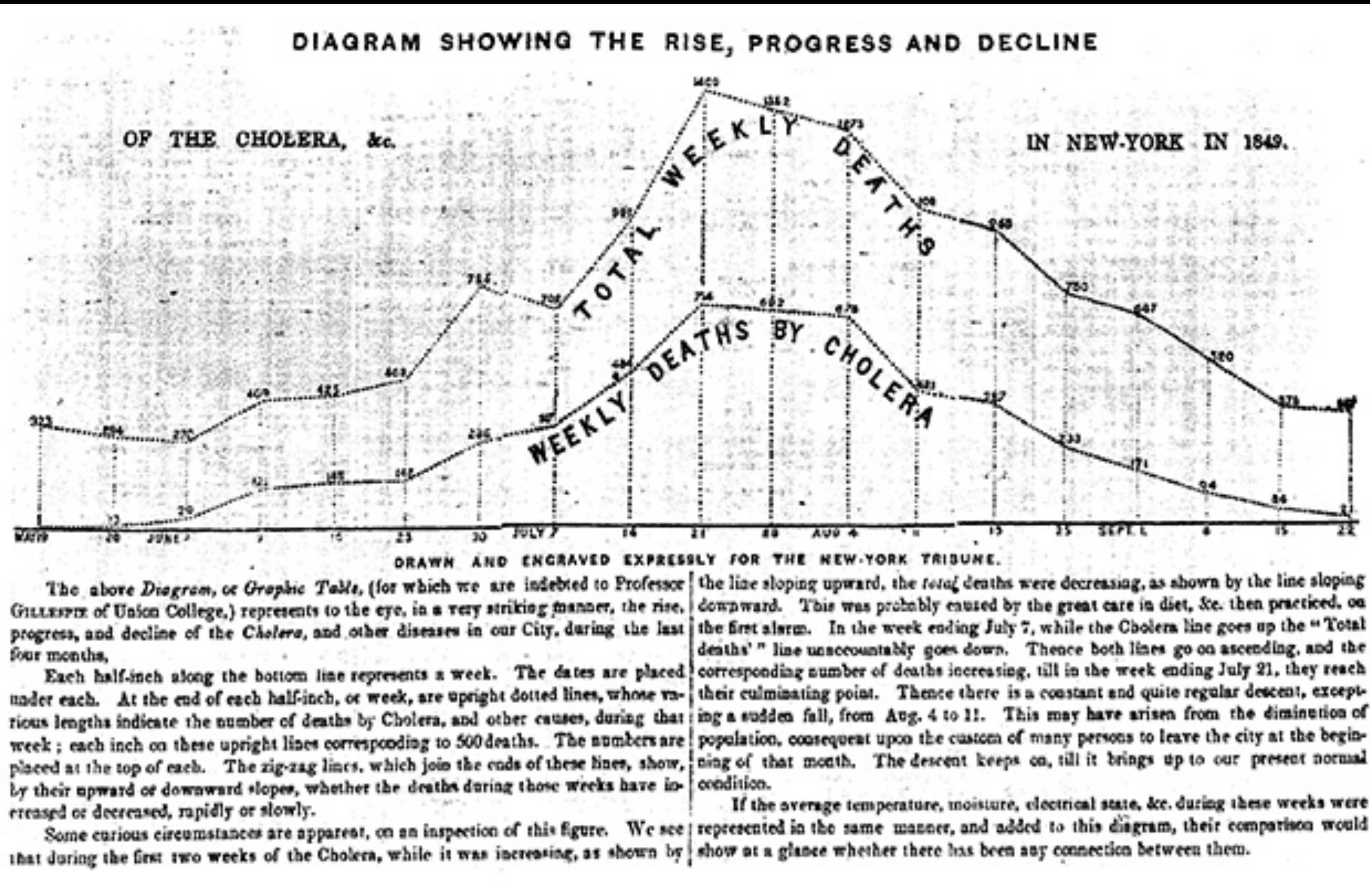
We can add “how to read this chart” explainers to our visualizations

If your audience isn't your peers, or if you don't know your audience well, don't fear redundancy. **Show AND tell**

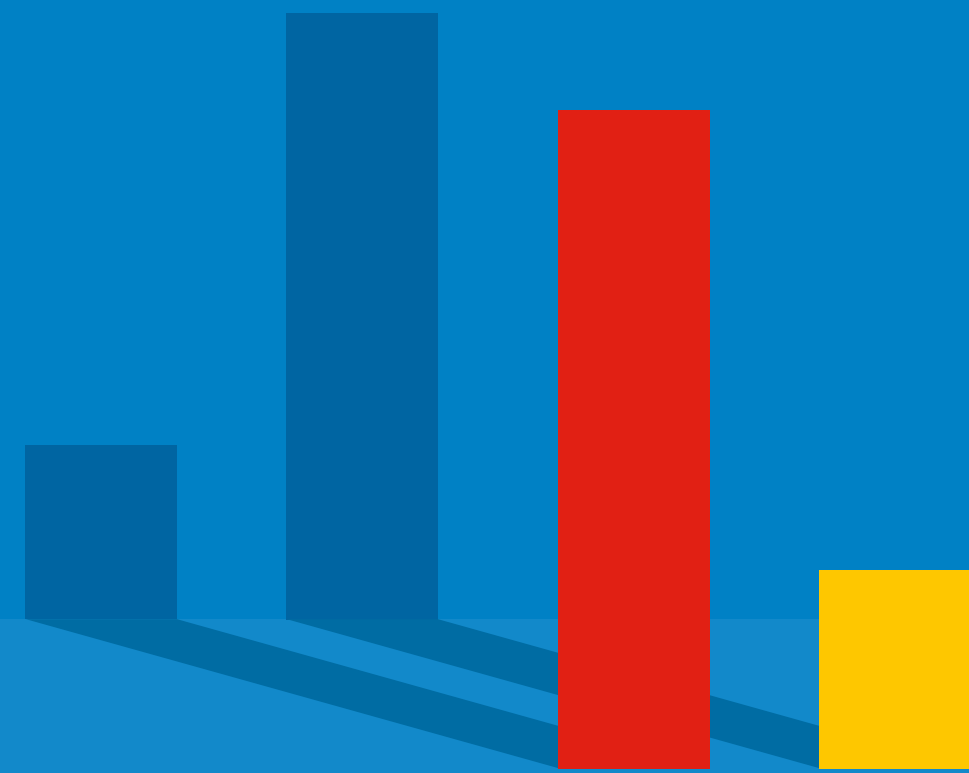


Hans Rosling: www.gapminder.org

If your audience isn't your peers, or if you don't know your audience well, don't fear redundancy. **Show AND tell**



Scott Klein: <https://www.propublica.org/nerds/infographics-in-the-time-of-cholera>



THANK YOU!

www.thefunctionalart.com • Twitter: @albertocairo