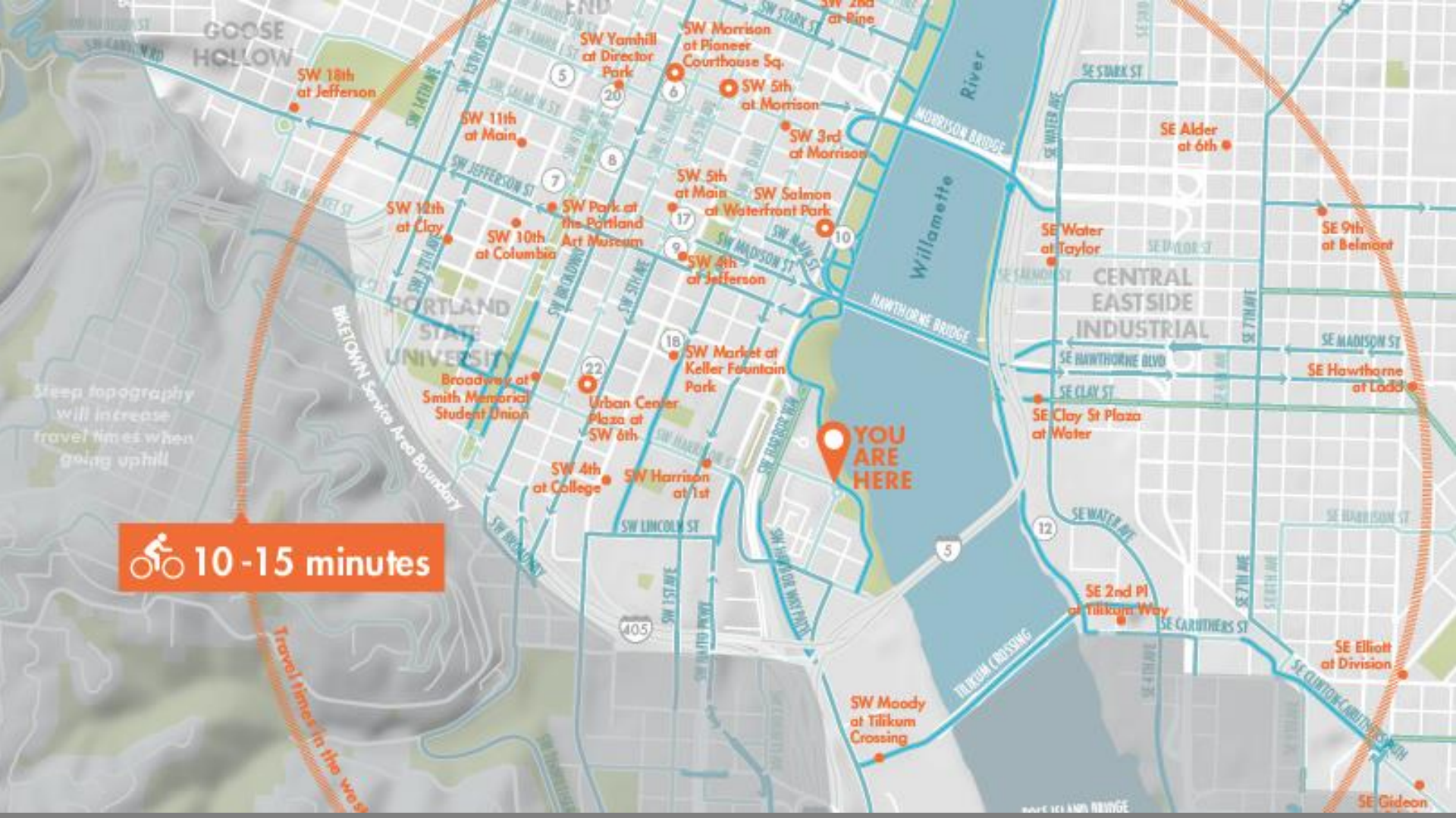


INFORMATION GRAPHICS

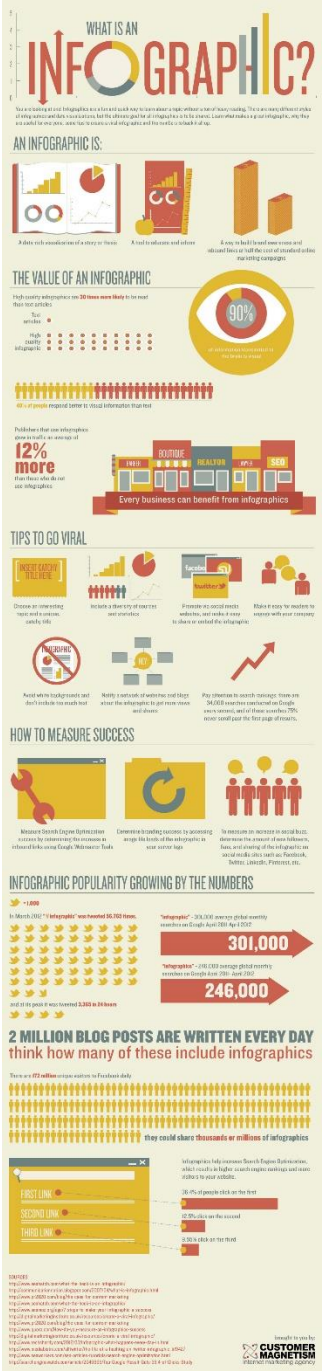
Cartographic Design & Principles| Winter 2018

What's an Infographic?

An ***artistic representation of data & information*** using different elements including maps, graphs, pictures, diagrams, narratives, timelines, flowcharts, etc.

"***produces form and shape to a number of separate ideas, which are otherwise abstract and unconnected.***"

William Playfair, 1759-1823



https://www.customermagnetism.com/wp-content/uploads/2012/11/what-is-an-infographic.jpg

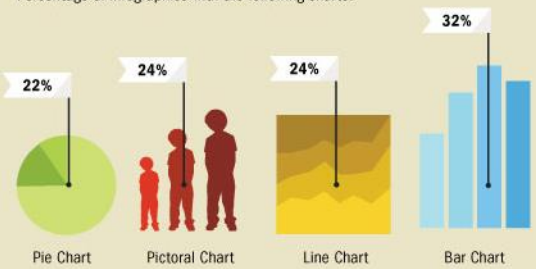
INFOGRAPHIC OF INFOGRAPHICS

Data visualization is a popular new way of sharing research. Here is a look at some of the visual devices, informational elements, and general trends found in the modern day infographic.

DESIGN

CHART STYLE

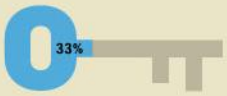
Percentage of infographics with the following charts:



FONT

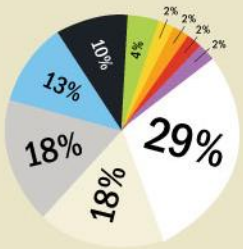
KEY INFO

Percentage of infographics with key:



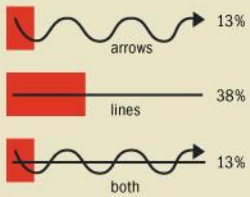
Average number of symbols per key: **5.1**

BASE COLOR



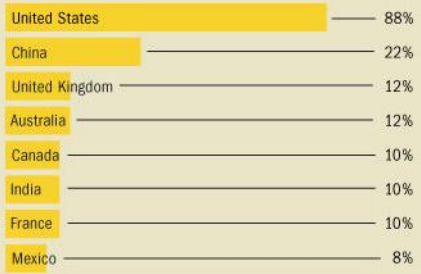
NAVIGATIONAL ICONOGRAPHY

Frequency of arrows & connecting lines in infographics:



CONTENT

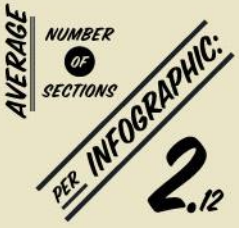
COUNTRIES FEATURED



THEME

Relative popularity of different infographic themes:

SECTIONS



CREDITED SOURCES

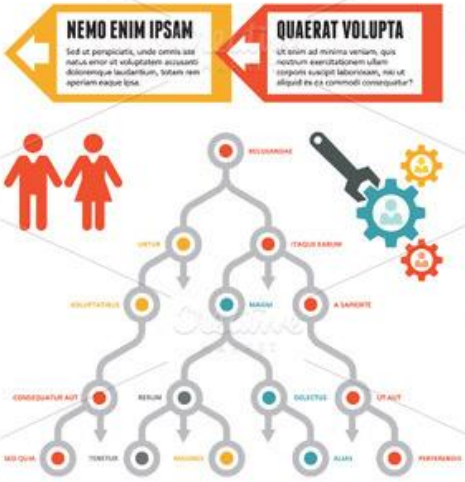
Average number of sources per infographic: **2.29**

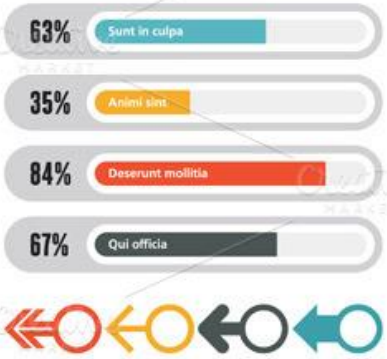
TITLE

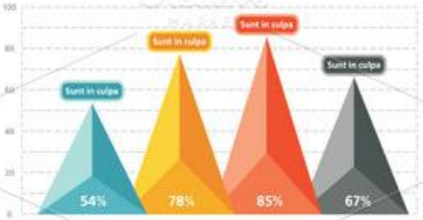
Average number of words per infographic title: **4.36**

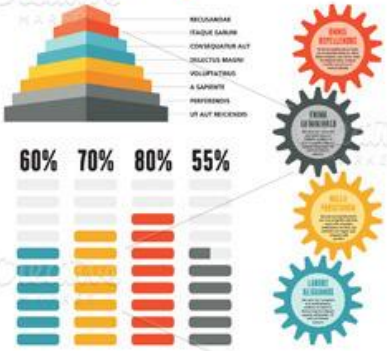
"RICHEST AND POOREST AMERICAN NEIGH

INFOGRAPHICS ELEMENTS 01









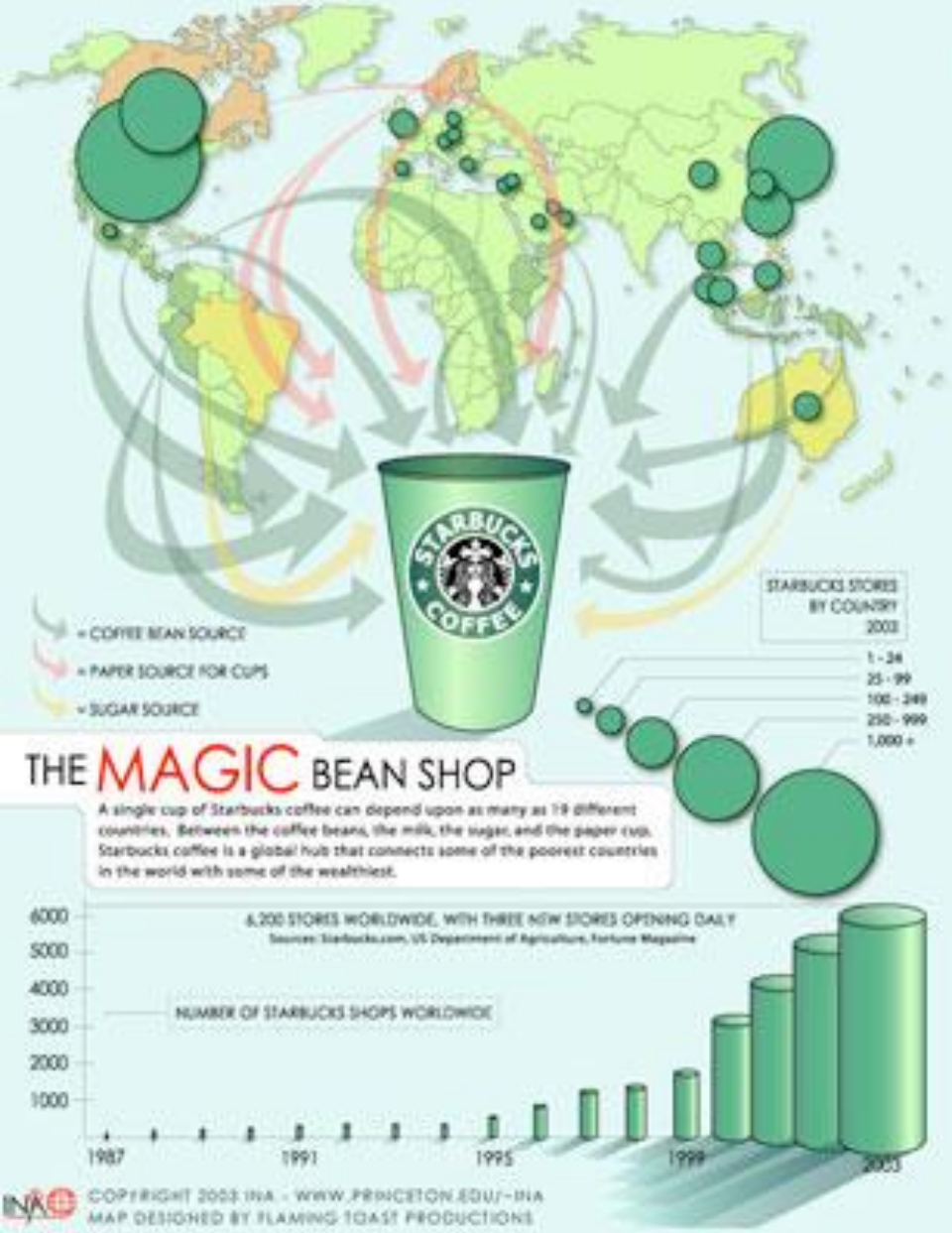
What's an Infographic?

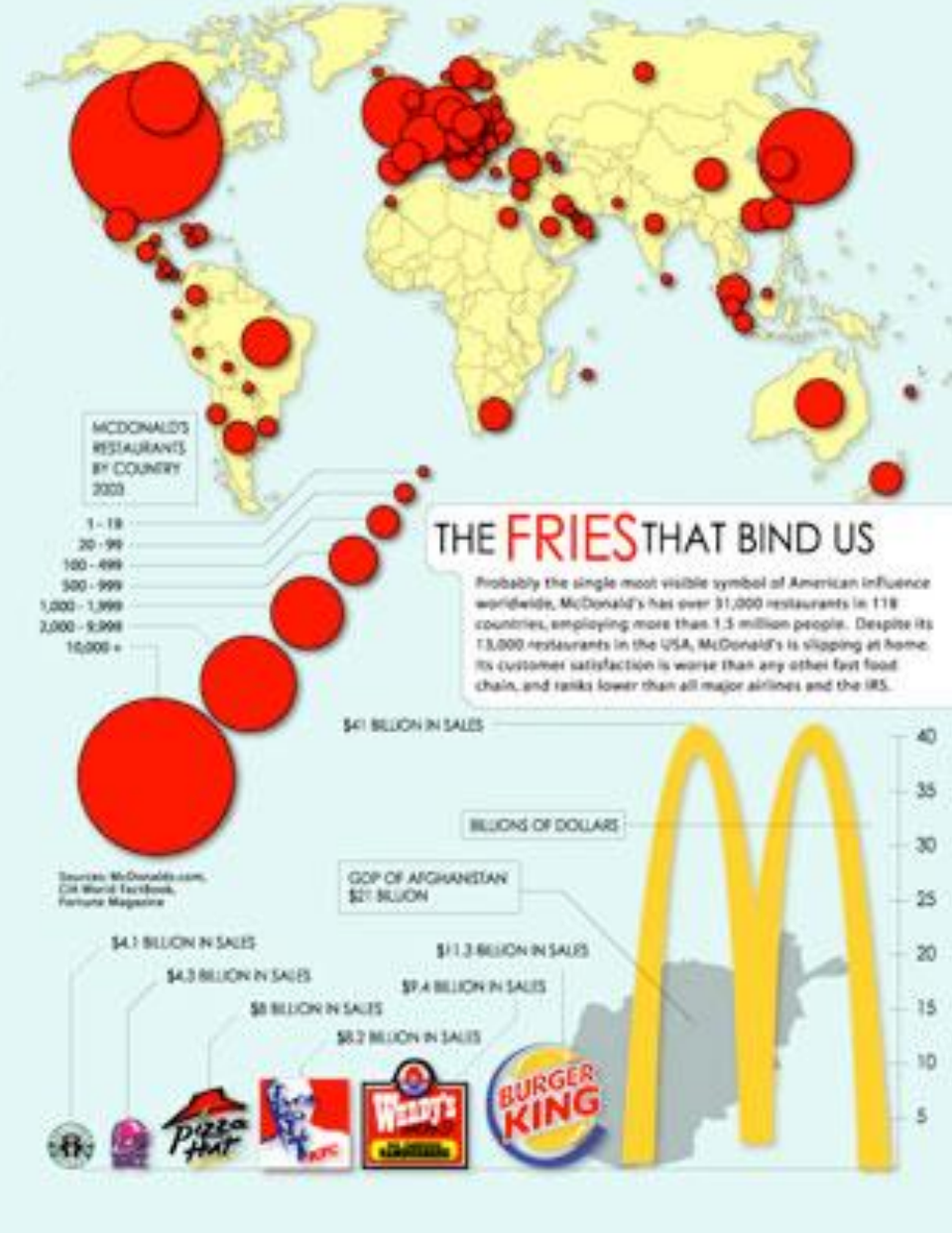
- They allow us to tell a more complete **story** of the data in an engaging way
- Use **engaging** visuals, but stay focused on the message
- **Raw data** transforms into **easy to understand visuals**

Key elements

- Present complex information quickly & clearly
- Integrate words & graphics to reveal information, patterns, or trends
- Easier to understand than words alone
- Beautiful & engaging

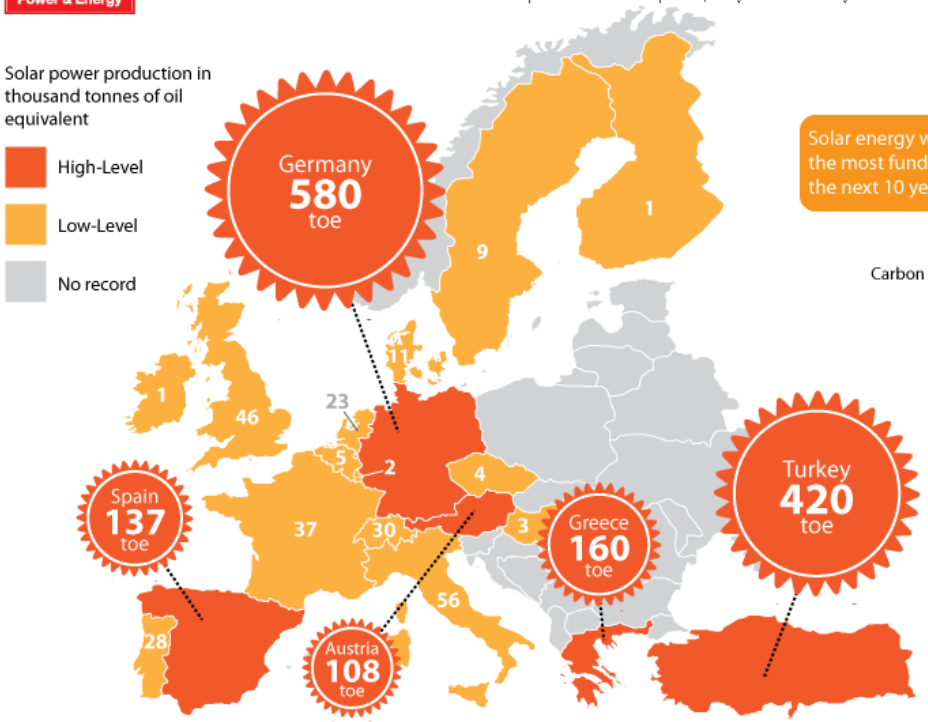
Some examples


= COFFEE BEAN SOURCE
= PAPER SOURCE FOR CUPS
= SUGAR SOURCE
STARBUCKS COFFEE
STARBUCKS STORES BY COUNTRY 2003
1 - 24
25 - 99
100 - 249
250 - 999
1,000 +
THE MAGIC BEAN SHOP
A single cup of Starbucks coffee can depend upon as many as 19 different countries. Between the coffee beans, the milk, the sugar, and the paper cup, Starbucks coffee is a global hub that connects some of the poorest countries in the world with some of the wealthiest.
6,200 STORES WORLDWIDE, WITH THREE NEW STORES OPENING DAILY
Sources: Starbucks.com, US Department of Agriculture, Fortune Magazine
NUMBER OF STARBUCKS SHOPS WORLDWIDE
6000
5000
4000
3000
2000
1000
1987
1991
1995
1999
2003
COPYRIGHT 2003 INA - WWW.PRINCETON.EDU/~INA
MAP DESIGNED BY FLAMING TOAST PRODUCTIONS

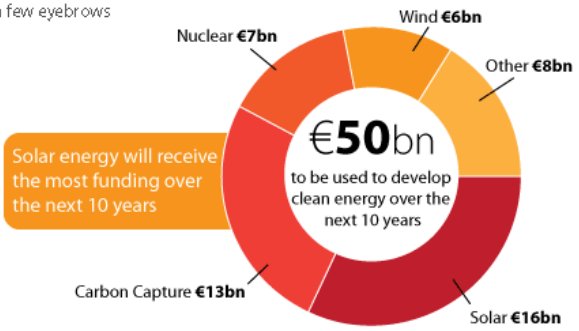

MCDONALD'S RESTAURANTS BY COUNTRY 2003
1 - 19
20 - 99
100 - 499
500 - 999
1,000 - 1,999
2,000 - 9,999
10,000 +
THE FRIES THAT BIND US
Probably the single most visible symbol of American influence worldwide, McDonald's has over 31,000 restaurants in 118 countries, employing more than 1.5 million people. Despite its 13,000 restaurants in the USA, McDonald's is slipping at home. Its customer satisfaction is worse than any other fast food chain, and ranks lower than all major airlines and the IRS.
Sources: McDonalds.com, CIA World Factbook, Fortune Magazine
$41 BILLION IN SALES
BILLIONS OF DOLLARS
GDP OF AFGHANISTAN $21 BILLION
$4.1 BILLION IN SALES
$4.3 BILLION IN SALES
$8 BILLION IN SALES
$8.2 BILLION IN SALES
$9.4 BILLION IN SALES
$11.3 BILLION IN SALES
Pizza Hut
Wendy's
BURGER KING
40
35
30
25
20
15
10
5

Solar Power in Europe

The European Commission's latest plan to reduce carbon emissions by pumping a huge slice of the 50 billion euros available for research and development into solar power, may raise a few eyebrows



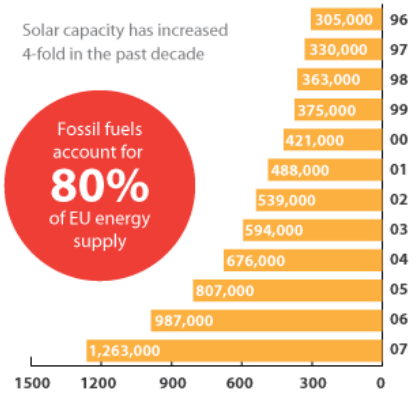
Funding a Low-Carbon Future



Total Solar Energy Production, EU 27 (toe)

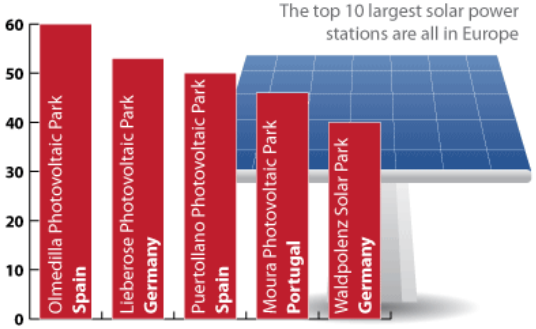
Solar capacity has increased 4-fold in the past decade

Fossil fuels account for **80%** of EU energy supply



World's Largest Photovoltaic Power Stations (Peak Power, MW)

The top 10 largest solar power stations are all in Europe



European Commission's Strategic Energy Technology Plan, Goals to be met by 2020

15% of EU electricity will be generated by solar energy

20% of EU electricity will be generated by wind energy

14% of the EU energy mix will be sustainable bio-energy

Enough solar energy falls on the earth's surface in twenty minutes to meet our needs for a year.

WHEN PLATES COLLIDE

PREDICTING THE NEXT BIG EARTHQUAKE

A year after the devastating earthquake in Haiti, people everywhere have been speculating about when and where the next cataclysmic one will hit our shores. If major quakes occur approximately 15 times a year around the world, where will the next one hit?

HOW OFTEN DO MAJOR EARTHQUAKES OCCUR*?

MAGNITUDE	AVERAGE FREQUENCY PER YEAR
2-2.9	1,300,000
3-3.9	130,000
4-4.9	13,000
5-5.9	1,319
6-6.9	134
7-7.9	15
8.0+	1

On average, the vast majority of detectable tremors range between a magnitude of 2.0 and 4.0 on the Richter scale. Earthquakes comparable to the ones that rocked Haiti and Chile last year occur about 17 times a year. Those greater than an 8.0 magnitude happen approximately once a year.

Largest recorded earthquake in the world:

MAGNITUDE 9.5

CHILE, MAY 22 1960

*Based on observations since 1900. Earthquake magnitudes before this year are estimates based on historical geological evidence.

DETECTED VS. UNDETECTED

Several million earthquakes shock the world each year, but many go undetected because they hit remote areas or have small magnitudes.

There are an estimated

500,000

detected in the world each year.

100,000

of those can be felt.

100

of them cause damage.

WHERE WILL THE NEXT BIG EARTHQUAKE STRIKE?

Although it's impossible to predict with a precise date and time, there are earthquake 'hot spots' that scientists have identified, using historical information and sensitive tectonic plates as guides. Cataclysmic earthquakes can occur anywhere, but based on past notable earthquakes, these areas are often cited as some of the most susceptible.

Key:

Magnitude: 6.0 - 6.4 | 6.5 - 6.9 | 7.0 - 7.4 | 7.5 - 7.9 | 8.0 - 8.4 | 8.5 - 8.9 | 9.0 - 9.4 | 9.5 - 9.9

CALIFORNIA

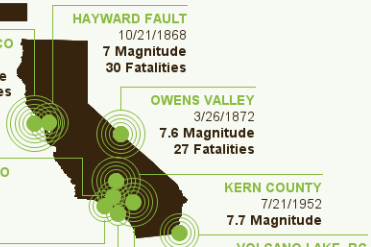
The San Andreas fault zone that forms the tectonic boundary between the Pacific Plate and the North American Plate cuts through a large length of California and has created many notable earthquakes.

THE PROBABILITY* OF A MAJOR EARTHQUAKE, OVER THE NEXT 30 YEARS, OCCURRING IN:

SAN FRANCISCO BAY AREA: 67%

SOUTHERN CALIFORNIA: 60%

*Based on scientific estimates



SAN FRANCISCO
4/18/1906
8.25 Magnitude
3,000+ Fatalities

HAYWARD FAULT
10/21/1868
7 Magnitude
30 Fatalities

OWENS VALLEY
3/26/1872
7.6 Magnitude
27 Fatalities

SAN FERNANDO
2/9/1971
6.6 Magnitude
65 Fatalities

KERN COUNTY
7/21/1952
7.7 Magnitude

NORTH RIDGE
1/17/1994
6.7 Magnitude
60 Fatalities

VOLCANO LAKE, BC
11/21/1915
7.1 Magnitude

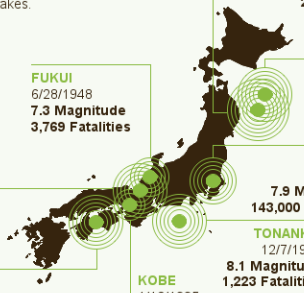
WRIGHTWOOD
12/8/1812
6.9-7.5 Magnitude
40 Fatalities

LONG BEACH
3/10/1933
6.4 Magnitude
40 Fatalities

The average rate of motion across the San Andreas Fault Zone is **TWO INCHES A YEAR.** At this rate, Los Angeles and San Francisco could be pushed together as neighbors in **15 MILLION YEARS.**

JAPAN

Roughly the same size as the state of California, Japan also has very active plate tectonics. The Tokai Gap of Japan is expected to rupture roughly every 150 years, causing 8.0 magnitude earthquakes.



SANRIKU
6/15/1896
8.5 Magnitude
27,000 Fatalities

FUKUI
6/28/1948
7.3 Magnitude
3,769 Fatalities

SANRIKU
3/2/1933
8.4 Magnitude
2,990 Fatalities

KANTO
9/1/1923
7.9 Magnitude
143,000 Fatalities

MINO-OWARI
10/27/1891
8 Magnitude
7,237 Fatalities

TONANKAI
12/7/1944
8.1 Magnitude
1,223 Fatalities

NANKAIDO
12/20/1946
8.1 Magnitude
1,330 Fatalities

KOBE
1/16/1995
6.9 Magnitude
5,502 Fatalities

While California has roughly 37 million inhabitants, Japan has a population more than 3 times as large, with many packed into dense cities.

CHILE

Claiming the highest magnitude earthquake in recorded history, Chile is no stranger to calamitous earthquakes. Many of the country's deadliest quakes are due to offshore plate collisions that cause large tsunamis that threaten coastal communities.

ARICA
8/13/1868
9 Magnitude
25,000 Fatalities

TARAPACA
6/13/2005
7.8 Magnitude
11 Fatalities

SALAMANCA
4/6/1943
8.2 Magnitude
25 Fatalities

LA LIGUA
3/28/1965
7.4 Magnitude
400 Fatalities

VALPARAISO
8/17/1906
8.2 Magnitude
3,882 Fatalities

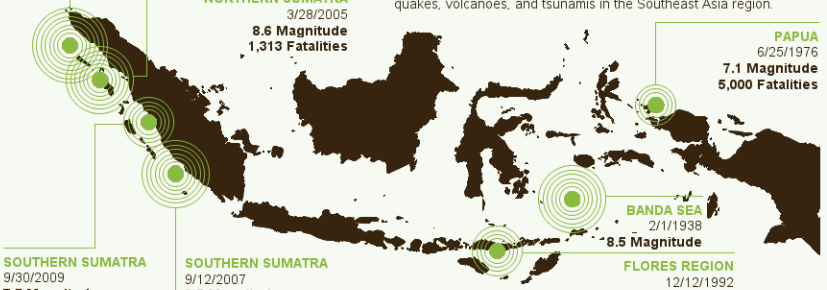
VALPARAISO REGION
7/9/1971
7.5 Magnitude
90 Fatalities

MAULE
2/27/2010
8.8 Magnitude
486 Fatalities

VALDIVIA
5/22/1960
9.5 Magnitude
5,700 Fatalities

INDONESIA

Indonesia sits at the center of turbulent fault lines that have been pressed against each other for thousands of years. Called the 'Ring of Fire,' it's a semicircle of volcanoes and shifting plates surrounding the edge of the Pacific Ocean. This volatile area has triggered countless quakes, volcanoes, and tsunamis in the Southeast Asia region.



SUMATRA-ANDAMAN ISLANDS
12/26/2004
9.1 Magnitude
227,898 Fatalities

NORTHERN SUMATRA
3/28/2005
8.6 Magnitude
1,313 Fatalities

PAPUA
6/25/1976
7.1 Magnitude
5,000 Fatalities

BANDA SEA
2/1/1938
8.5 Magnitude

SOUTHERN SUMATRA
9/30/2009
7.5 Magnitude
1,117 Fatalities

SOUTHERN SUMATRA
9/12/2007
8.5 Magnitude
25 Fatalities

FLORES REGION
12/12/1992
7.8 Magnitude
2,500 Fatalities

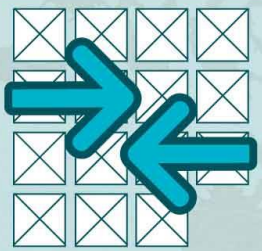
Sources: U.S. Geological Survey | Discover | Time | Live Science

SAS/GRAPH version of Good and Column Five's chart

GLOBAL LOGISTICS

Every day, thousands of packages are transported across towns, countries, and entire continents. What does it really take to send a box from Switzerland to South Africa on time? In addition to a global network of delivery people, you need the power of logistics to bring air, ground, and water transport in sync with the latest high tech solutions for tracking and receiving. Here's a snapshot of how the global reach of UPS logistics facilitates package delivery to just about every destination, every day.

A DAY IN THE LIFE OF THE UPS FLEET



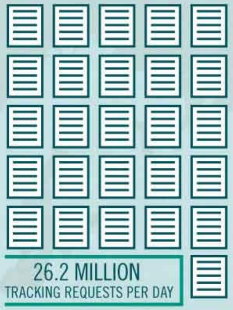
15.6 MILLION PACKAGES & ☒ ☒ ☒ DOCUMENTS DELIVERED DAILY

218 JETS IN SERVICE

942 DOMESTIC AND 815 INTERNATIONAL FLIGHT SEGMENTS PER DAY

92,734 DELIVERY CARS, VANS, TRACTORS & MOTORCYCLES

1,928 ALTERNATIVE FUEL VEHICLES



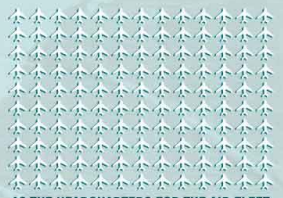
26.2 MILLION TRACKING REQUESTS PER DAY

27,280 FREIGHT TRACTORS & TRAILERS

UPS WORLDPORT BY THE NUMBERS

UPS WORLDPORT IS LOCATED IN LOUISVILLE, KENTUCKY

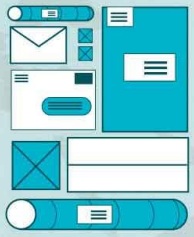
Worldport recently has undergone a billon dollar upgrade, and is now one of the most advanced distribution hubs in the world.



AS THE HEADQUARTERS FOR THE AIR FLEET, THE HUB HAS 70 PLANE DOCKS AND TURNS OVER 130 AIRCRAFT DAILY

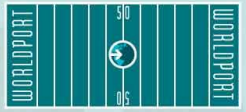
SORTS 416,000 PKGS PER HOUR, OR ABOUT 115 PKGS PER SECOND.

1.5 MILLION PACKAGES DELIVERED ON AN AVERAGE DAY



WORLDPORT MEASURES 5,200,000 SQ. FT.

OR ABOUT 90 FOOTBALL FIELDS



HAS 155 MILES OF CONVEYOR BELTS

AIRPORTS AND HUBS WORLDWIDE

EUROPE: COLOGNE/BONN, GERMANY

Covers 60 countries and territories

ASIA PACIFIC:

CHINA : SHANGHAI, SHENZHEN, HONG KONG

Covers 40 countries and territories

UPS EMPLOYS OVER 400,000 PEOPLE WORLDWIDE

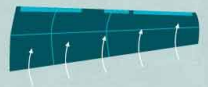
COUNTRIES AND TERRITORIES COVERED 220

PREDICTING MOTHER NATURE

A TEAM OF 5 METEROLOGISTS FOLLOW THE ATMOSPHERIC CONDITIONS 24 HOURS A DAY.

TO INSURE ONTIME DELIVERY, THEY WORK WITH THE NATIONAL WEATHER SERVICE TO FORECAST WEATHER ALONG ROUTES AND WILL RE-ROUTE OR SWITCH MODES OF TRANSPORTATION TO AVOID BAD WEATHER.

UPS PLANES ARE EQUIPPED WITH SENSORS FOR REAL-TIME WEATHER DATA RETRIEVAL.



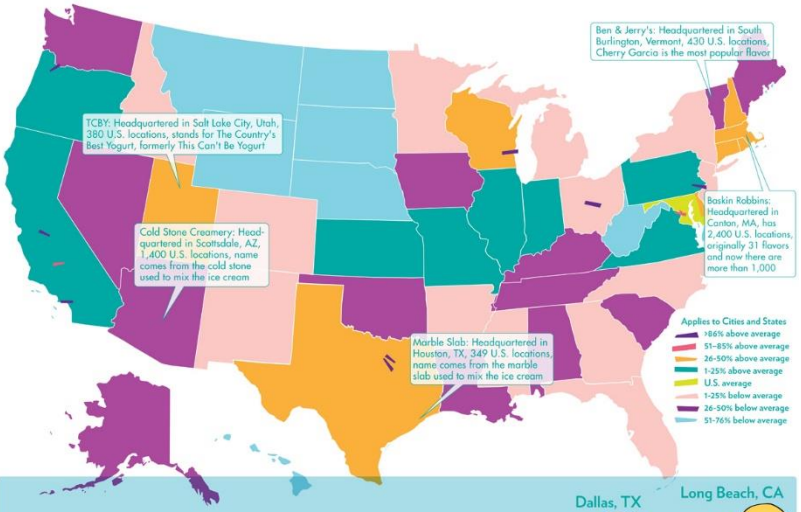
USE ON-SITE MODEL OF AN AIRPLANE WING TO PREDICT ICING AND FROST CONDITIONS IN THE AIR.

A COLLABORATION BETWEEN GOOD AND KIKI KARPUS, IN PARTNERSHIP WITH UPS

bundle

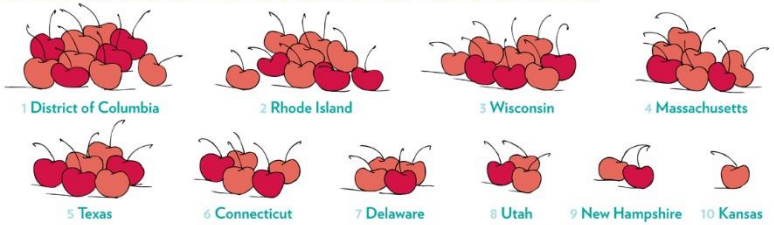
ICE CREAM COUNTRY

The Cities and States That Eat the Most Ice Cream in America



Top Ten ICE CREAM CONSUMING CITIES

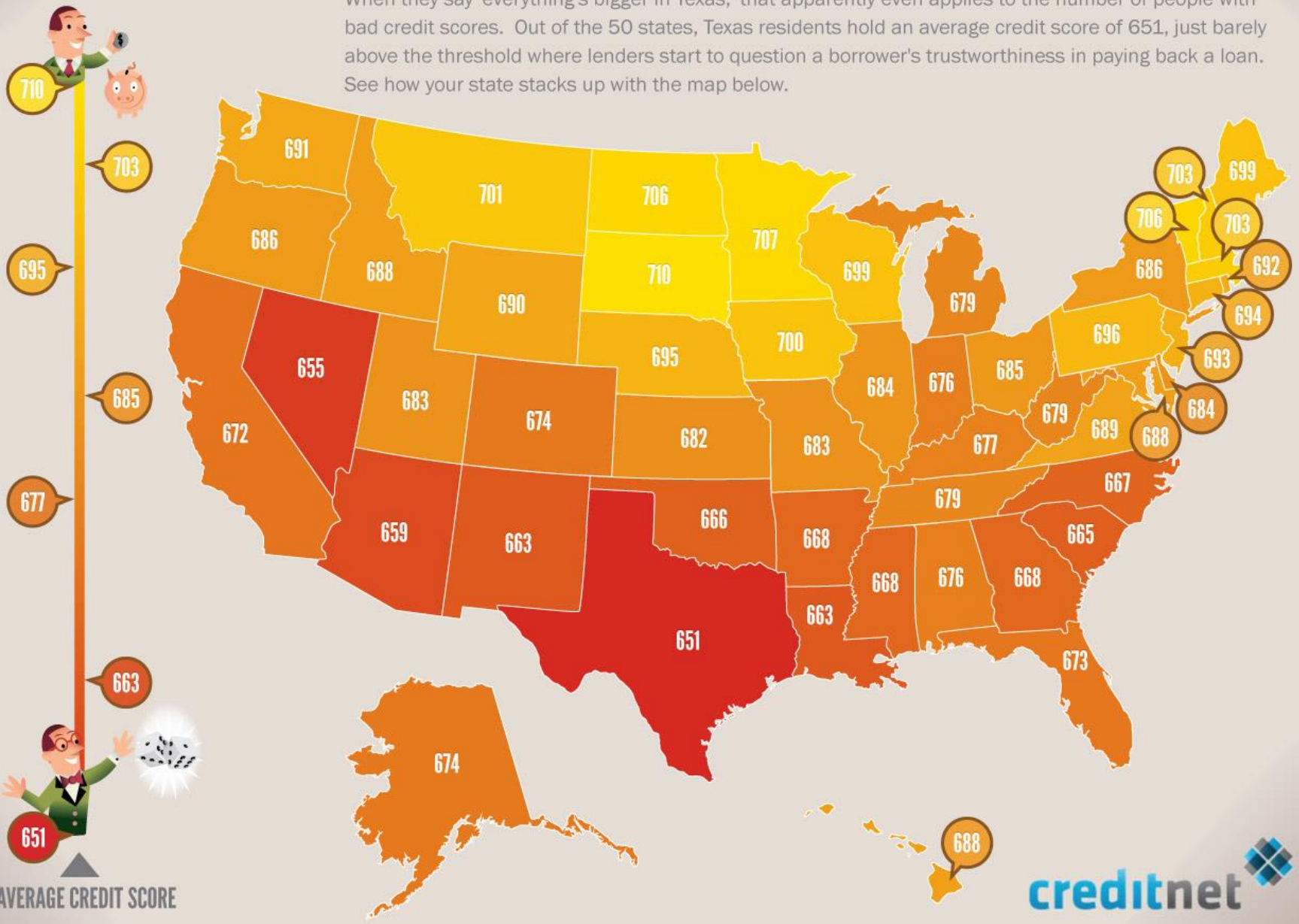
Top Ten ICE CREAM CONSUMING STATES

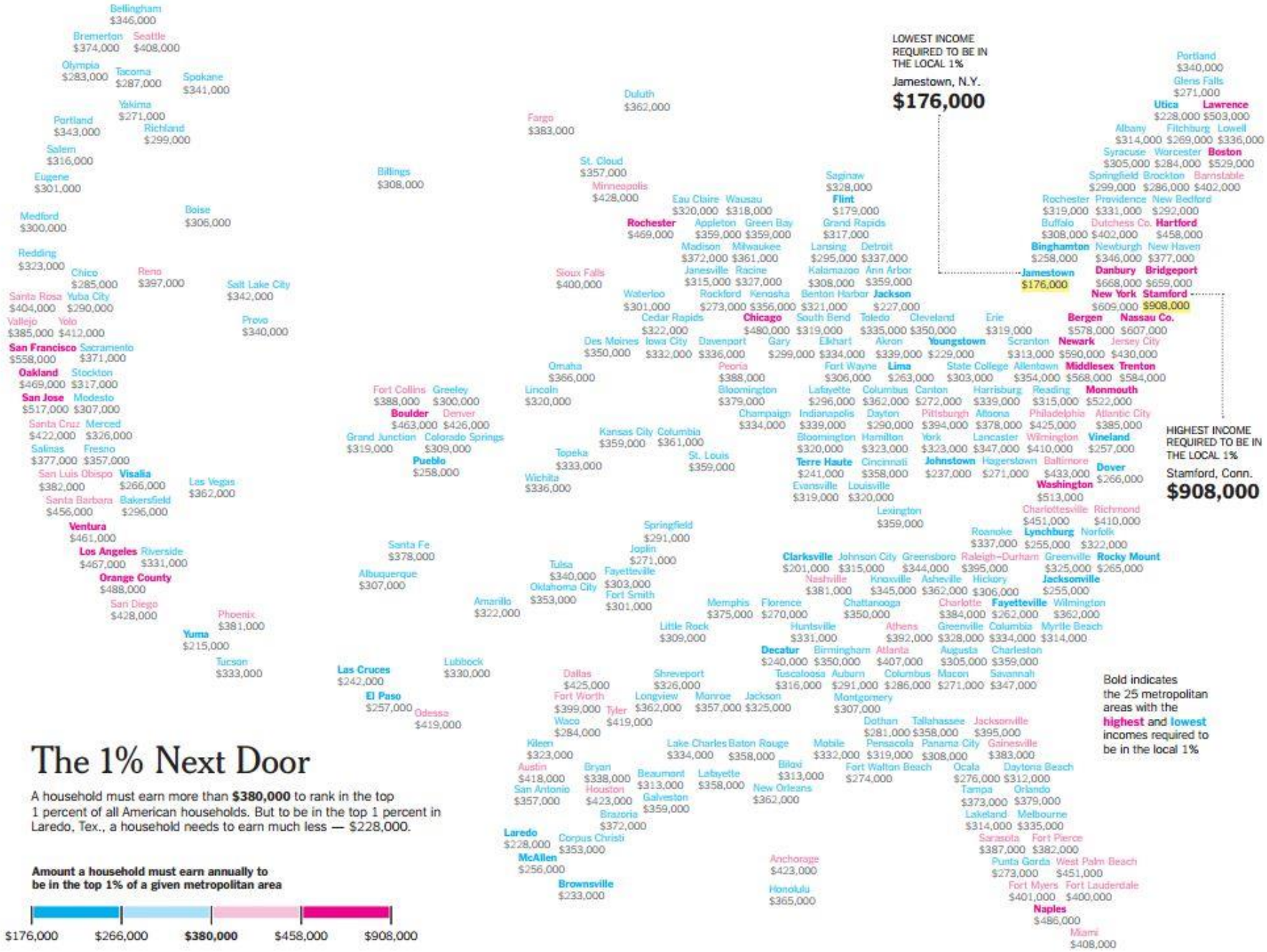


Methodology: Rankings are selected from a pool of the top 100 largest cities in the US based on population (including New York's 5 boroughs as separate cities). Examined all households which had a credit card transaction at ice cream and frozen yogurt vendors. Examined total number of transactions per city and ranked on a per capita basis.

THE UNITED STATES OF CREDIT SCORES

When they say 'everything's bigger in Texas,' that apparently even applies to the number of people with bad credit scores. Out of the 50 states, Texas residents hold an average credit score of 651, just barely above the threshold where lenders start to question a borrower's trustworthiness in paying back a loan. See how your state stacks up with the map below.





The 1% Next Door

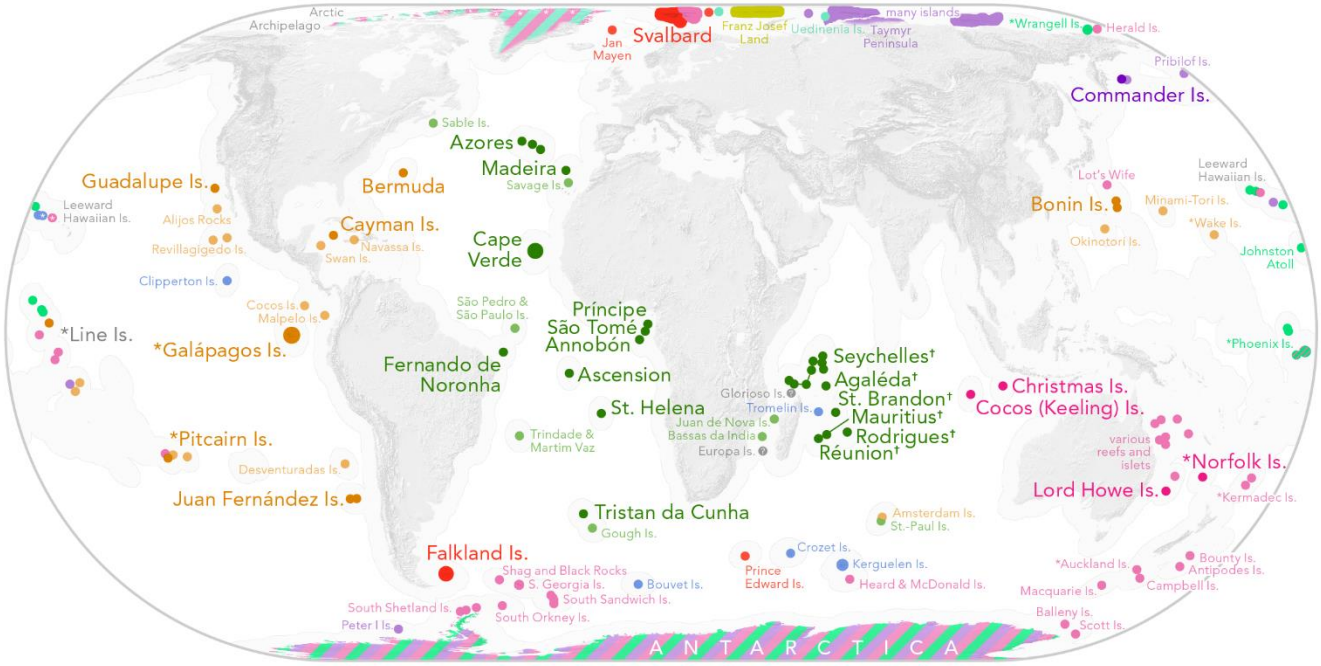
A household must earn more than **$380,000** to rank in the top 1 percent of all American households. But to be in the top 1 percent in Laredo, Tex., a household needs to earn much less — $228,000.

Source: New York Times analysis of University of Minnesota Population Center data

ROBERT GEBELOFF, FORD FESSENDEN AND ALICIA DeSANTIS/THE NEW YORK TIMES

Actual European Discoveries

land unknown by humans* before the Age of Exploration



NOTES

Large Dark Names = currently inhabited

Small Light Names = currently uninhabited (or only military / scientific personnel)

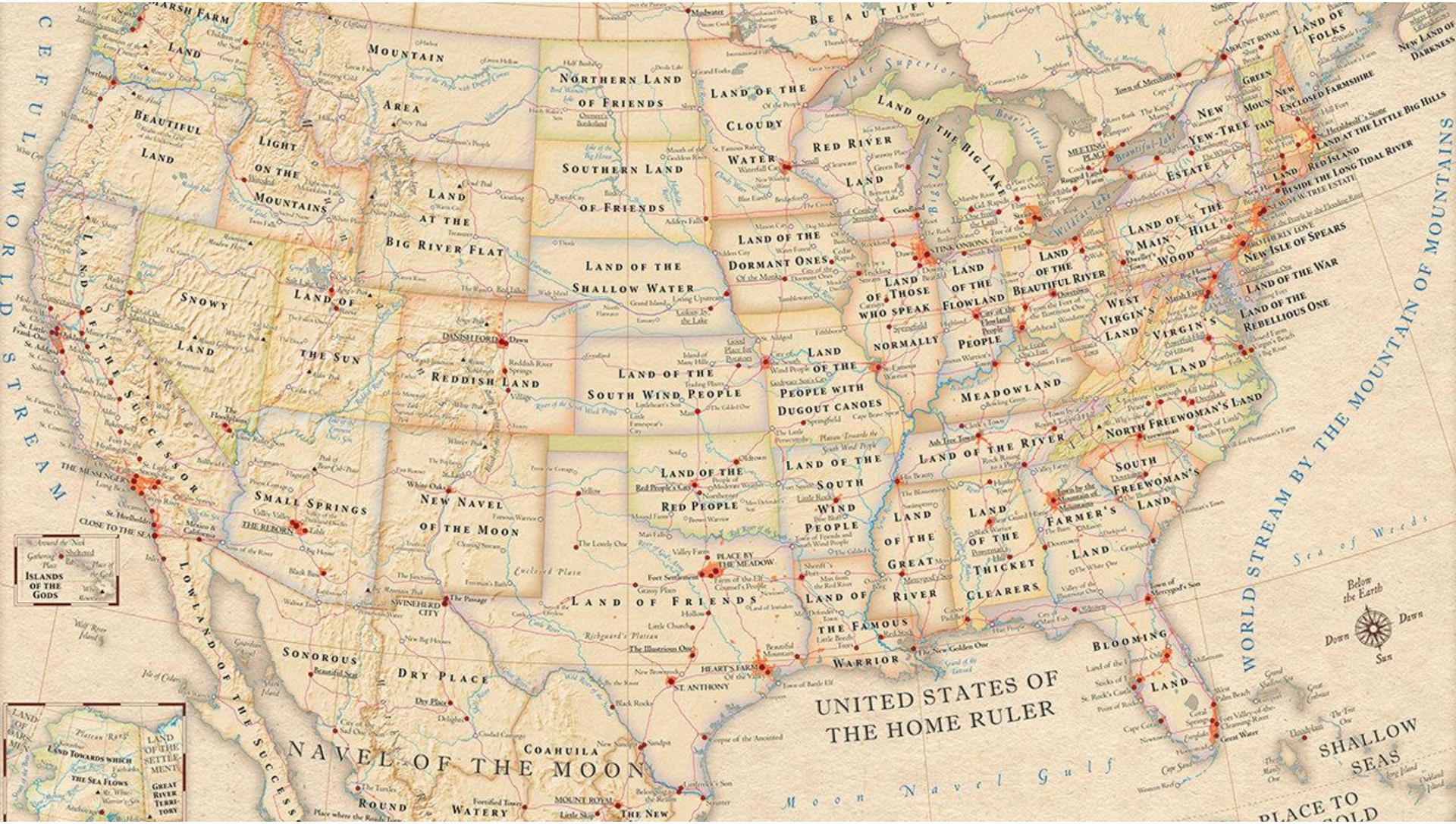
Stripes indicate ambiguous or shared discovery.

* Islands marked with an asterisk show evidence of prior human inhabitation but were unoccupied at the time of European discovery. (The north coast of Greenland was also previously occupied. The South Shetland Islands may have been as well.)

† Islands in the Indian Ocean marked with a dagger were known to Arab traders but never occupied.

All islands labeled with present-day names, which are often different from the names given at discovery. Equal-area projection (Eckert IV).
Map by Bill Rankin, 2013; www.radicalcartography.net

country sponsoring original exploration	date of first discovery	total area discovered (non-continental; km²)	current population of discovered land
Portugal	1418	13,776	3,424,609
Spain	1493	8,938	149,732
Netherlands	1596	73,903	5,642
United Kingdom	1609	10,597	11,436
France	1711	7,627	70
Russia	1712	74,634	613
United States	1796	7,699	3,754
Austria-Hungary	1873	16,134	0
Norway	1878	34	0
		213,342 (roughly the area of Great Britain; 0.14% of all land) (adding continental land at the poles, ~11% of all land)	3,595,856 (0.05% of all humans)


UNITED STATES OF THE HOME RULER
NAVEL OF THE MOON
WORLD STREAM BY THE MOUNTAIN OF MOUNTAINS
Moon Navel Gulf
Sea of Weeds
SHALLOW SEAS
Below the Earth
Down
Dawn
Sun
Lake Superior
Big Lake
Bear's Head Lake
Wilderness Lake
Beautiful Lake
Mountain
Northern Land of Friends
Land of the Cloudy Water
Red River Land
Land of the Big Lake
Beautiful Land
Light on the Mountains
Area
Southern Land of Friends
Land at the Big River Flat
Land of the Shallow Water
Land of the Dormant Ones
Land of Those Who Speak Normally
Land of the Flowland People
Land of the Beautiful River
Land of the Main-Hill Wood
Land of the Snowy Land
Land of the Sun
Land of the Reddish Land
Land of the South Wind People
Land of the People with Dugout Canoes
Land of the Red People
Land of the South Wind People
Land of the Great River
Land of the Thicket Clearers
Land of the Farmer's Land
Land of the Meadowland
Land of the River
Land of Friends
Land of the Famous Warrior
Land of the Rebellious One
Land of the War
Land of the Folks
Land of the Yew-Tree Estate
Land at the Little Big Hills
Land Beside the Long Tidal River
Land of the Blooming Land
Land of the Small Springs
Land of the New Navel of the Moon
Land of the Sonorous Dry Place
Land of the Lowland of the Successor
Land of the Light on the Mountains
Land of the Beautiful Land
Land of the Snowy Land
Land of the Sun
Land of the Reddish Land
Land of the Big River Flat
Land of the Shallow Water
Land of the Dormant Ones
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Land of the Beautiful Land
Land of the Snowy Land
Land of the Sun
Land of the Reddish Land
Land of the Small Springs
Land of the New Navel of the Moon
Land of the Sonorous Dry Place
Land of the Lowland of the Successor
Islands of the Gods
Land Towards Which the Sea Flows
Land of the Settlements
Great River Territory
Coahuila
Watery Round
Mount Royal
The New
Heart's Farm
St. Anthony
Swineherd City
Dry Place
Sonorous
Small Springs
New Navel of the Moon
Lowland of the Successor
Close to the Sea
Place by the Meadow
Foot Settlement
Valley Farm
Enclosed Farmshire
Land at the Little Big Hills
Land Beside the Long Tidal River
Land of the War
Land of the Rebellious One
Land of the Blooming Land
Land of the Farmer's Land
Land of the Thicket Clearers
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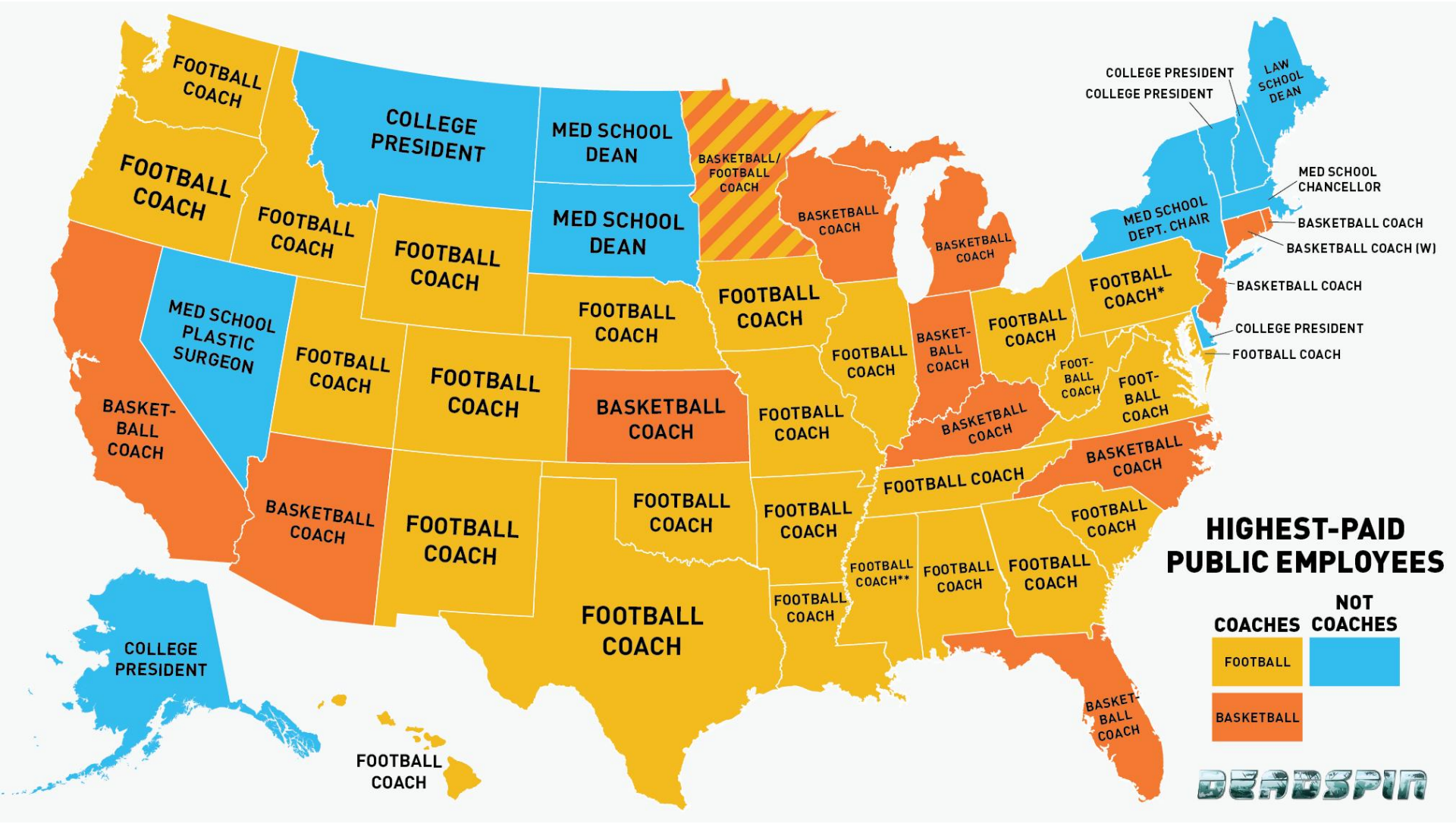
FOOTBALL COACH
FOOTBALL COACH
COLLEGE PRESIDENT
MED SCHOOL DEAN
BASKETBALL/ FOOTBALL COACH
BASKETBALL COACH
BASKETBALL COACH
COLLEGE PRESIDENT
COLLEGE PRESIDENT
LAW SCHOOL DEAN
MED SCHOOL CHANCELLOR
MED SCHOOL DEPT. CHAIR
BASKETBALL COACH
BASKETBALL COACH (W)
BASKETBALL COACH
FOOTBALL COACH*
COLLEGE PRESIDENT
FOOTBALL COACH
FOOTBALL COACH
MED SCHOOL DEAN
FOOTBALL COACH
FOOTBALL COACH
MED SCHOOL PLASTIC SURGEON
FOOTBALL COACH
FOOTBALL COACH
FOOTBALL COACH
BASKET-BALL COACH
BASKET-BALL COACH
FOOT-BALL COACH
FOOT-BALL COACH
BASKETBALL COACH
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FOOTBALL COACH
FOOTBALL COACH
BASKET-BALL COACH
COLLEGE PRESIDENT
FOOTBALL COACH
HIGHEST-PAID PUBLIC EMPLOYEES
COACHES
NOT COACHES
FOOTBALL
BASKETBALL
DEADSPIN

Where the Closet Is Still Common

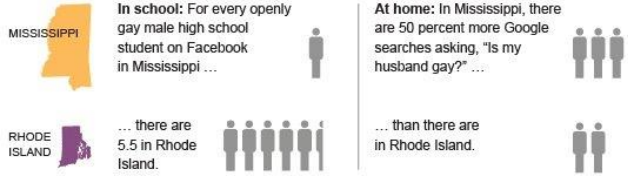
THE TOLERANCE SPECTRUM

Here is the American landscape of acceptance and rejection of gays, based on an analysis of support for gay marriage initiatives in 2012.

ARE THERE FEWER GAY MEN IN THE LEAST TOLERANT STATES?

GROUPS OF STATES	HIGH SCHOOLERS: The online **public sphere** gives that impression. Percent of male Facebook profiles, of those with a gender preference, choosing men:	ALL MALES: The online **public sphere** gives that impression. Percent of male Facebook profiles, of those with a gender preference, choosing men:	But in the **private sphere**, the gay share is larger and consistent. Percent of all Google porn searches seeking gay male images:
Very tolerant	1.4%	2.6%	5.4%
	1.4	2.4	5.1
	1.2	2.0	4.9
	1.2	1.8	4.7
Least tolerant	0.8	1.6	5.2

THE LEAST-ALIKE STATES: CONCEALMENT VS. OPENNESS



Calculations account for the differing populations of Mississippi and Rhode Island.

Sources: Analysis by Seth Stephens-Davidowitz; 2012 marriage initiative analysis by Nate Silver for The New York Times

Bill Marsh/The New York Times

Eye Candy & Resources

Examples.

1. http://www.creativebloq.com/graphic-design-tips/information-graphics-1232836
2. http://www.dailyinfographic.com/
3. https://www.good.is/infographics
4. http://www.instantshift.com/2009/06/07/infographic-designs-overview-examples-and-best-practices/
5. http://www.schrockguide.net/infographics-as-an-assessment.html
6. https://www.fastcodesign.com/1670019/10-steps-to-designing-an-amazing-infographic

Videos.

1. The five keys to a great infographic (Lynda.com)
2. Your brain on Visualization
3. 13 Reasons why your brain craves infographics

Tools in ArcGIS

Creating Graphs

- Creating a graph in ArcGIS can be done with spatial or non-spatial data
- Types of graphs that can be created:
  - Bar, histogram, line, area, scatterplot, box plot, bubble, polar, pie, scatterplot matrix
    http://desktop.arcgis.com/en/arcmap/10.3/map/graphs/types-of-graphs.htm