What's useful about mapping?

Yards

50   0   50   100   150   200
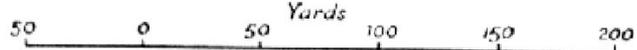
X Pump   • Deaths from cholera

OXFORD STREET

REGENT STREET

GT. MARLBOROUGH ST.

DEAN STREET

WARDOUR STREET

BROAD STREET

CONDUIT STREET

KING STREET

SAVILLE ROW

NEW BOND STREET

GOLDEN SQUARE

BREWER STREET

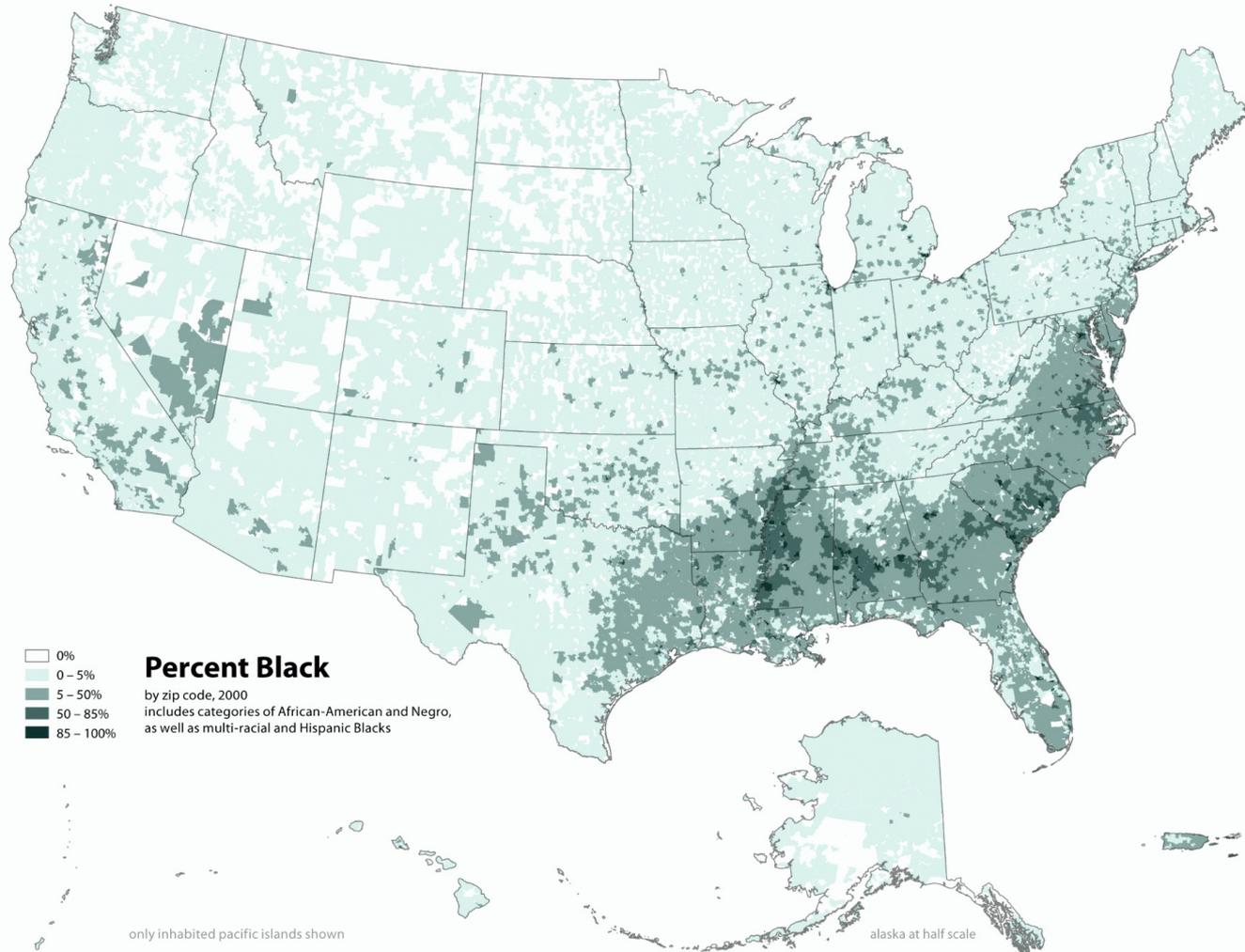REGENTS QUADRANT

PICCADILLY

Intent matters most in mapping

Your map form depends on what you want to show

Common types of maps

Choropleth

Percent Black

by zip code, 2000
includes categories of African-American and Negro,
as well as multi-racial and Hispanic Blacks

- 0%
- 0 – 5%
- 5 – 50%
- 50 – 85%
- 85 – 100%

only inhabited pacific islands shown
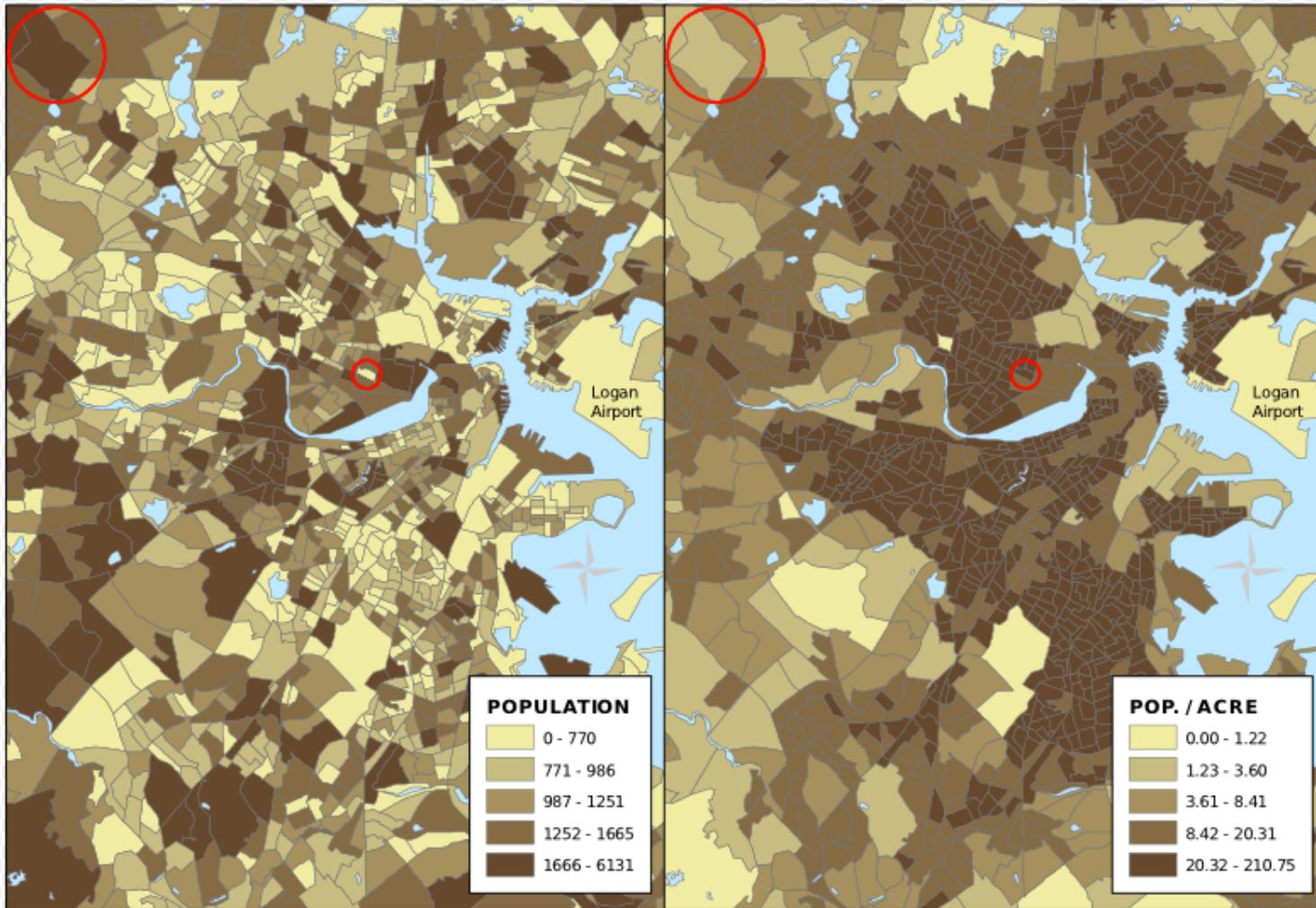
alaska at half scale

Choropleth

Good for:
- Showing normalized change or variation
- Highlighting areas

Common mistakes:
- Not so meaningful with small geographies
- Easy to misinterpret
- Forgetting to normalize

Total Population of 2000 Census Block Groups   Population Density of 2000 Census Block Groups

POPULATION

- 0 - 770
- 771 - 986
- 987 - 1251
- 1252 - 1665
- 1666 - 6131

POP. / ACRE

- 0.00 - 1.22
- 1.23 - 3.60
- 3.61 - 8.41
- 8.42 - 20.31
- 20.32 - 210.75

Logan Airport

Logan Airport

From Wikipedia.

Proportional circles
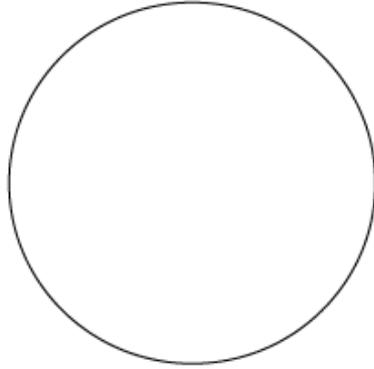

Rick Santorum's Race

Rick Santorum suspended his campaign Tuesday. In primaries and caucuses, Mr. Santorum carried much of the rural Midwest and South, and had heavy support from evangelical voters and the most conservative voters.

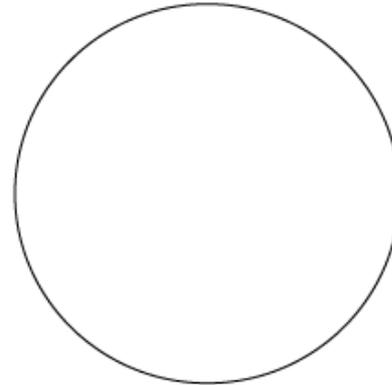■ Mitt Romney **661 delegates** | ■ Rick Santorum **285** | ■ Newt Gingrich **136** | ■ Ron Paul **51**
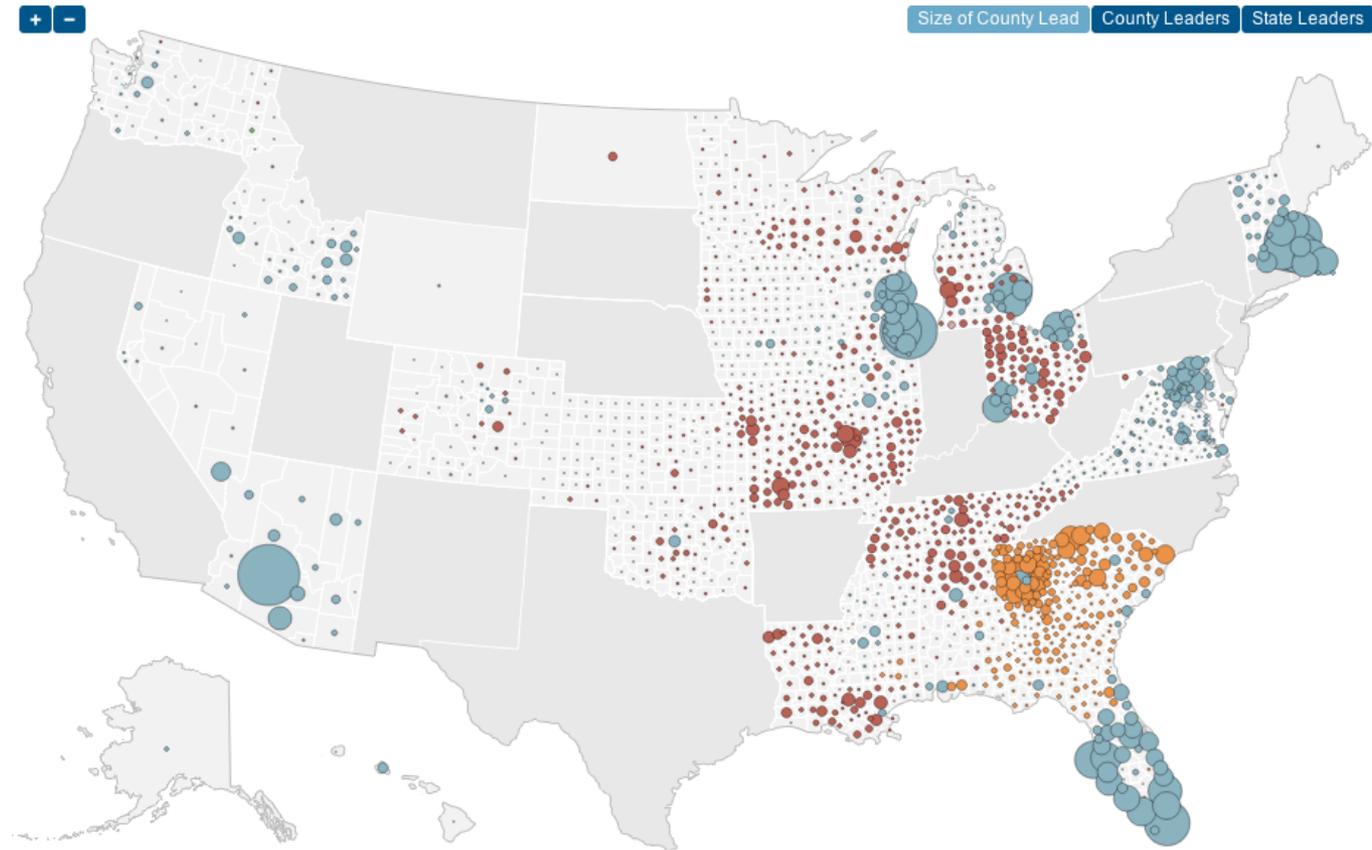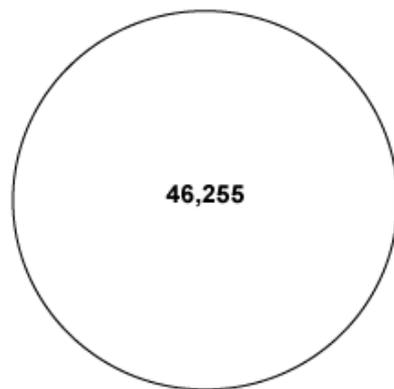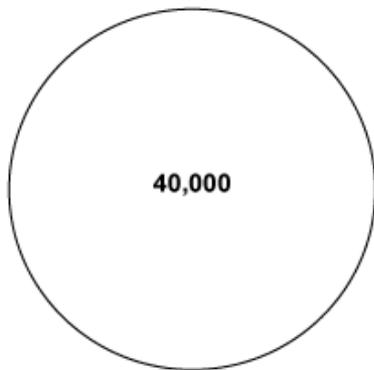
Circles vs. choropleths

2,500
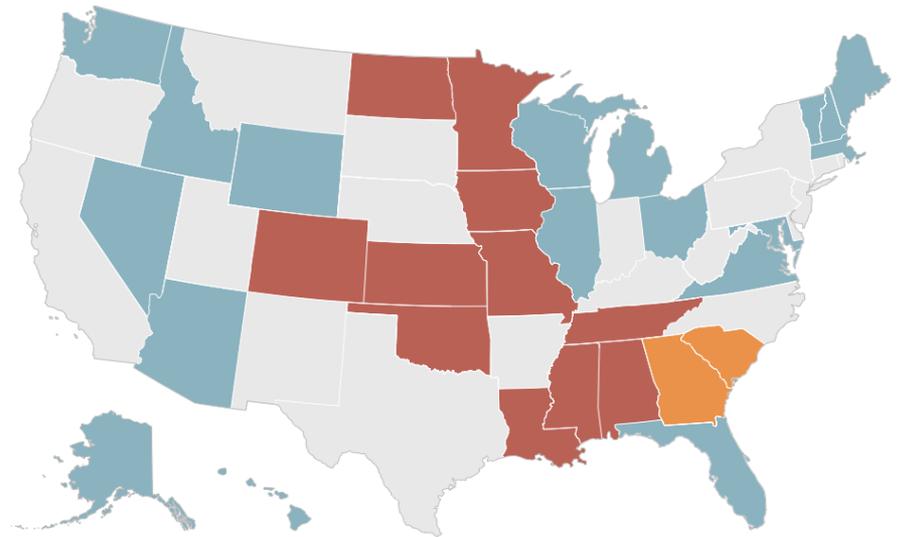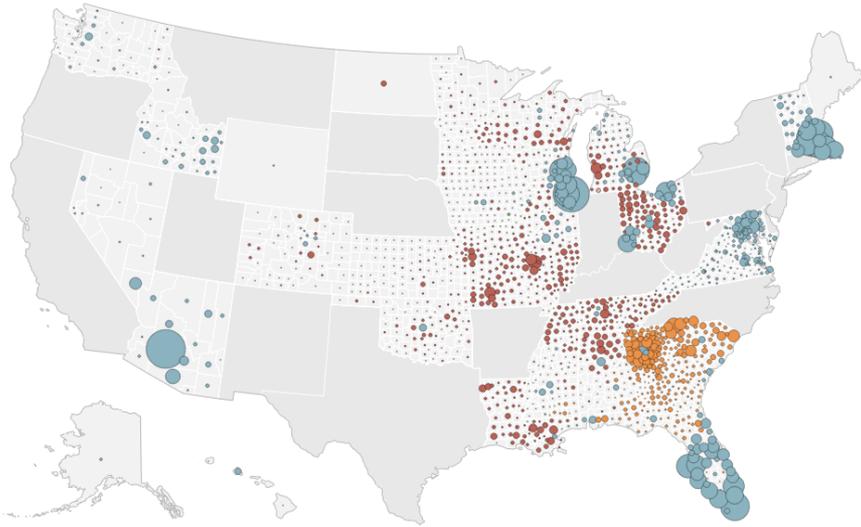
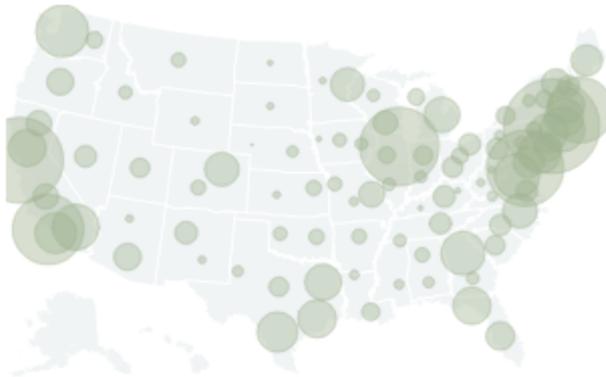What value does each circle represent?

40,000

2,500

46,255

Barack Obama

$196,900,097

Mr. Obama ended March with 10 times the cash on hand as Mr. Romney.

Mr. Obama continued to bring in large totals from coastal and urban areas.

CONTRIBUTIONS GREATER THAN $200 BY REGION

Mitt Romney

$87,452,399

1st of 9 Republican Candidates* as of March 31, 2012

The presumptive nominee, Mr. Romney ended March with $10 million in cash.

As in 2008, Mr. Romney did well in urban area and his bases of Massachusetts and Utah.

CONTRIBUTIONS GREATER THAN $200 BY REGION
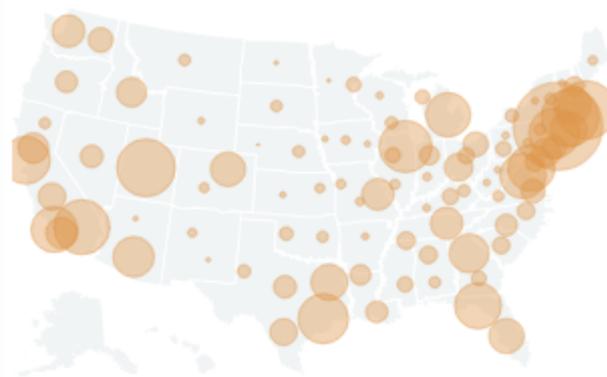
Proportional circles

Good for:
- Accurately showing full range of data
- Geographies of varying sizes
- Raw numbers

Common mistakes:
- Hard for normals to interpret
- Can be a proxy for population
- Not so exciting without lots of variation

"Heat" maps

A Persistent Disease

Malaria has been squeezed globally from both north and south, but remains endemic across much of the tropics.
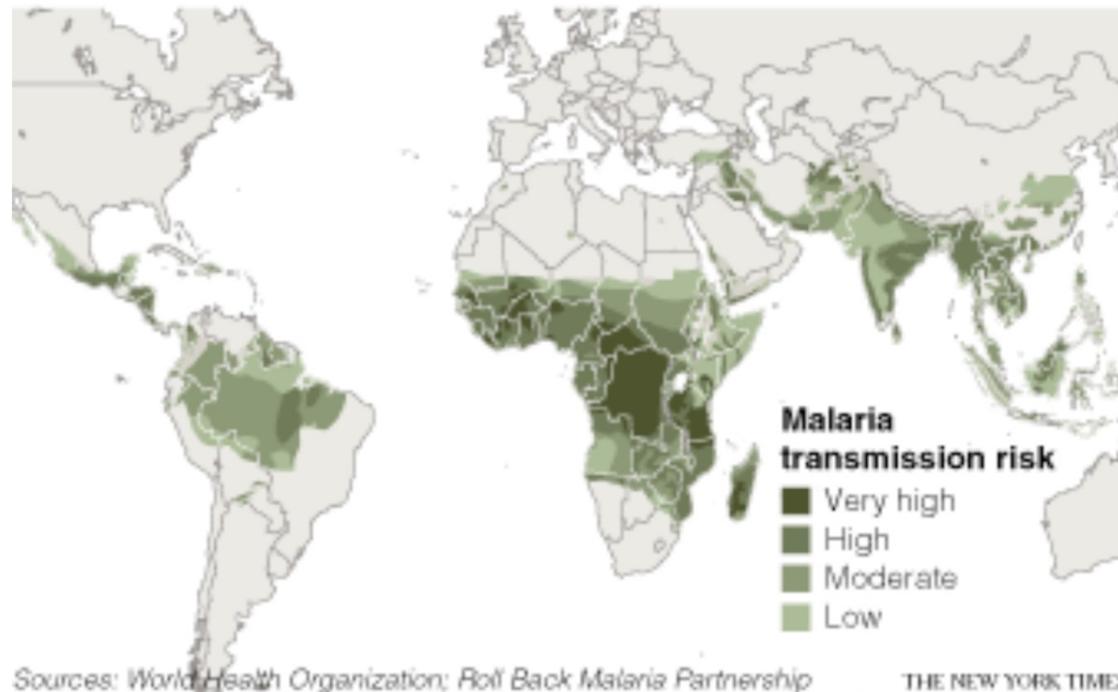
Malaria transmission risk
- Very high
- High
- Moderate
- Low

Sources: World Health Organization; Roll Back Malaria Partnership   THE NEW YORK TIMES
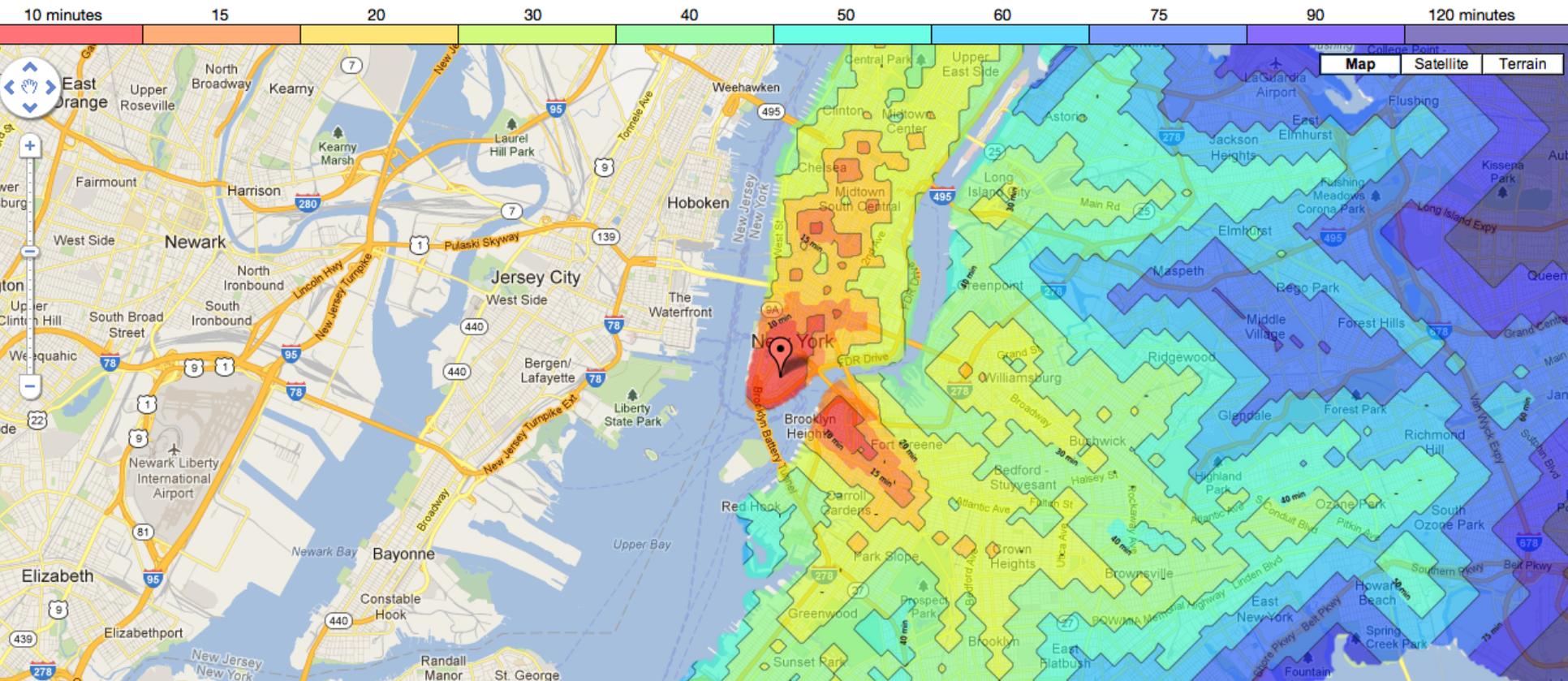
"Heat" maps

The World of Seven Billion

Where and how we live »

LOW INCOME LEVEL
$995 or less a year

100   1,000   10,000
People per square mile

LOWER MIDDLE
$996 to $3,945

100   1,000   10,000
People per square mile

UPPER MIDDLE
$3,946 to $12,195

100   1,000   10,000
People per square mile

HIGH
$12,196 or more

100   1,000   10,000
People per square mile
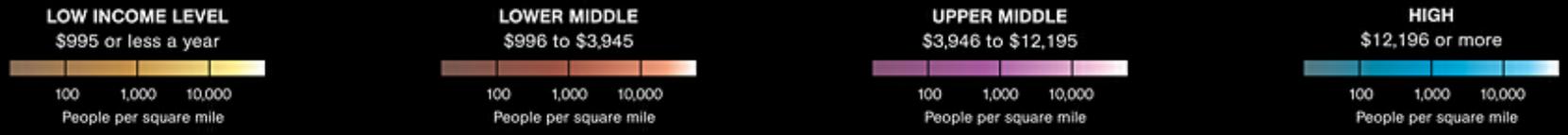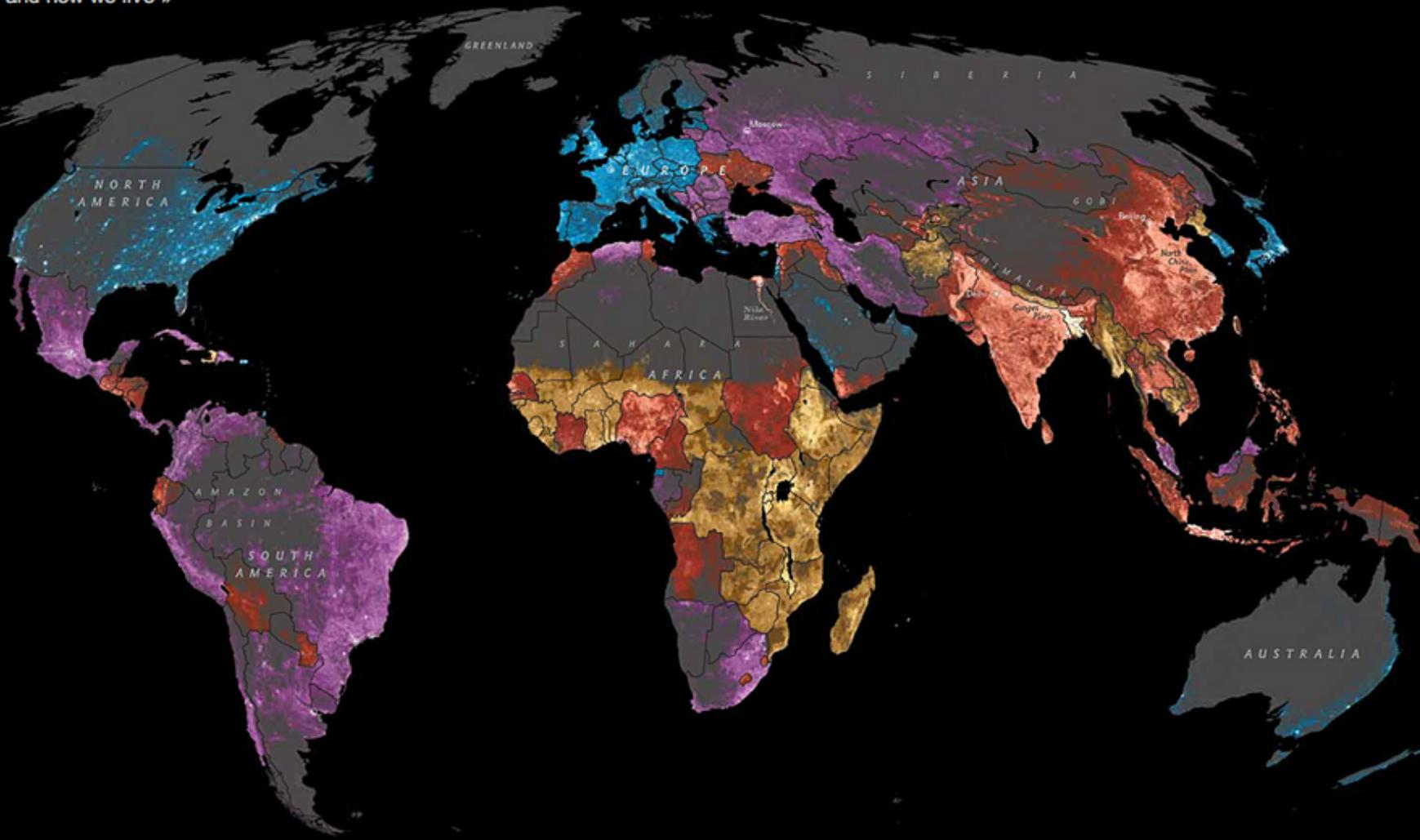
"Heat" maps

Good for:

• Showing concentrations

• Emphasizing the data, when data doesn't match existing boundaries

Common mistakes:

• Make sure colors and breaks are meaningful and thought out

EARTH ORBIT ON FEB. 6, 2007, 9 A.M. E.S.T.
Each dot represents a man-made object larger than 4 inches.

The Relay 2 communication satellite, at right, was launched by the United States on Jan. 21, 1964 and stopped working three years later.

Debris from rocket used to launch Relay 2, left.

Commercial communications satellite launched in June 1999.

Former Soviet Union communication satellite, launched in 1986 and now broken.

The Hubble Space Telescope, launched in 1990, orbits at an altitude of 380 miles.

International Space Station

In service from 1963 to 1977, the U.S.'s Midas 6 satellite was designed to detect launched intercontinental ballistic missiles.

Part of Russia's version of the Global Positioning System, this satellite was launched in 1991.

- ● **SPACECRAFT**
  There are more than 3,100 spacecraft orbiting Earth. Two-thirds of these are no longer active.

- ● **OLD DEBRIS**
  Nearly 7,000 pieces of man-made debris are large enough to be tracked.

- ● **NEW DEBRIS**
  The satellite destroyed by China last month has left nearly 1,000 pieces of large debris.

Orbiting Junk,
Once a Nuisance,
Is Now a Threat

Rocket debris, pictured at right, from when the Atlantis space shuttle launched a satellite from space in 1991.

NEW DEBRIS ON JAN. 11, 2007
The remnants from the Chinese satellite are quickly dispersing in Earth's orbit. More than half the spacecraft in orbit now pass through its debris field.
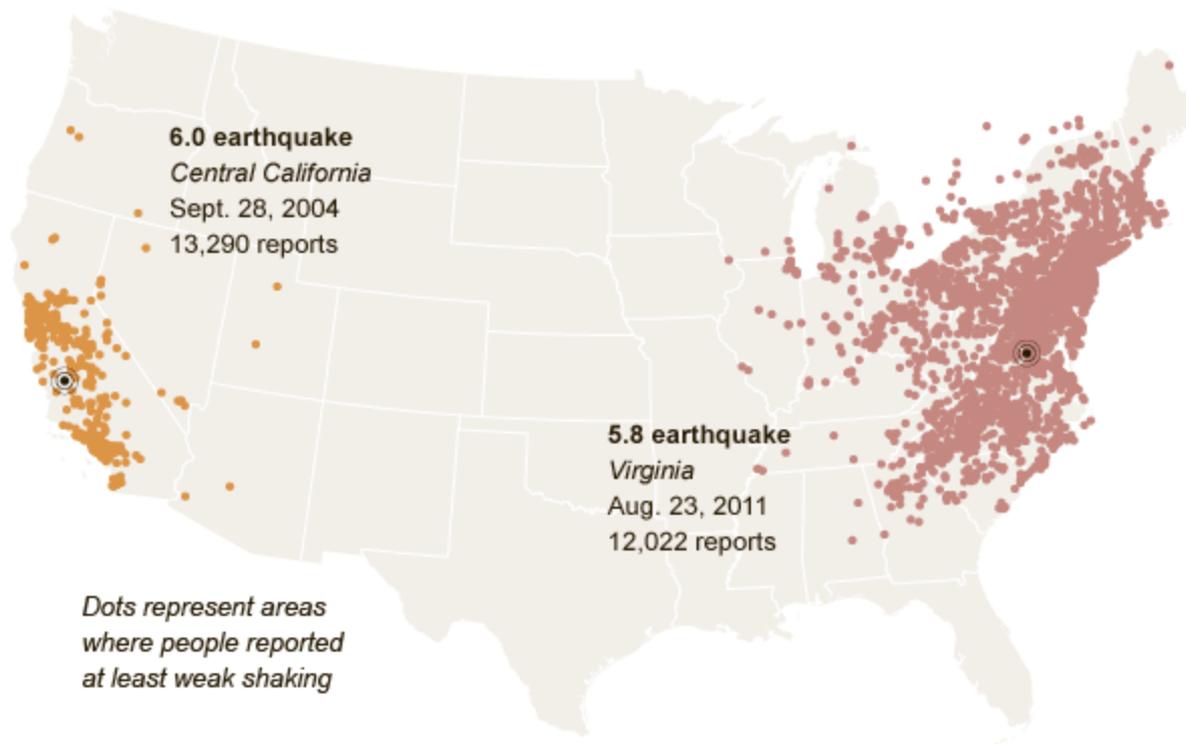
Dot maps

Good for:
- Showing density and distribution
- Geography that can't be easily grouped
- Showing single incidents or events
- If exact coordinates are important to your map

Dot maps

Comparing the extent of the shaking

Though less frequent, earthquakes on the East Coast can typically be felt over a much larger area than those with a similar magnitude on the West Coast. The bedrock in California, for example, is fractured, causing seismic waves that travel through it to dissipate faster. In the eastern half of the United States, the bedrock is less fractured and stronger, allowing earthquake energy to travel farther.

6.0 earthquake
Central California
Sept. 28, 2004
13,290 reports

5.8 earthquake
Virginia
Aug. 23, 2011
12,022 reports

Dots represent areas where people reported at least weak shaking

Toxic Waters

A series about the worsening pollution in American waters and regulators' response

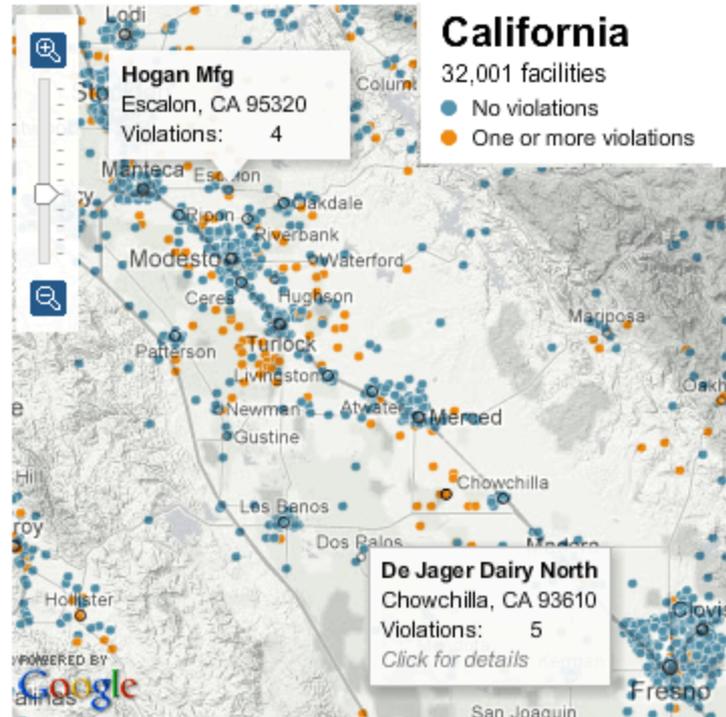🜨 **Compare enforcement records** around the nation | 🖺 **Data and comments** from the states | 🗩

Search by city or zip code:

[   ]

[Search]

Alabama	Missouri
Alaska	Montana
Arizona	Nebraska
Arkansas	Nevada
California	New Hampshire
Colorado	New Jersey
Connecticut	New Mexico
Delaware	New York
District of Columbia	North Carolina
	North Dakota
Florida	Ohio
Georgia	Oklahoma
Hawaii	Oregon
Idaho	Pennsylvania
Illinois	Rhode Island
Indiana	South Carolina
Iowa	South Dakota
Kansas	Tennessee
Kentucky	Texas
Louisiana	Utah
Maine	Vermont
Maryland	Virginia
Massachusetts	Washington
Michigan	West Virginia
Minnesota	Wisconsin
Mississippi	Wyoming

About This Data

State Responses and

Hogan Mfg
Escalon, CA 95320
Violations: 4

California
32,001 facilities
● No violations
● One or more violations

De Jager Dairy North
Chowchilla, CA 93610
Violations: 5
Click for details

POWERED BY Google

California

FACILITY NAME	CITY
🔍 **Radisson Hotel at Los Angeles Airport**	Los Angeles
🔍 **Haynes Generating Station**	Long Beach
🔍 **Townhomes at The River, Tract No 5353**	Fillmore
🔍 **California Credit Union**	Los Angeles

Other types of maps

Districts Across the Country Shift to the Right

BAR-TAILED GODWIT

Researchers studying the migration of bar-tailed godwits surgically implanted nine of the birds with battery-powered satellite transmitters, and found that the birds flew nonstop for distances of up to 7,100 miles from Alaska to their winter grounds in the South Pacific.
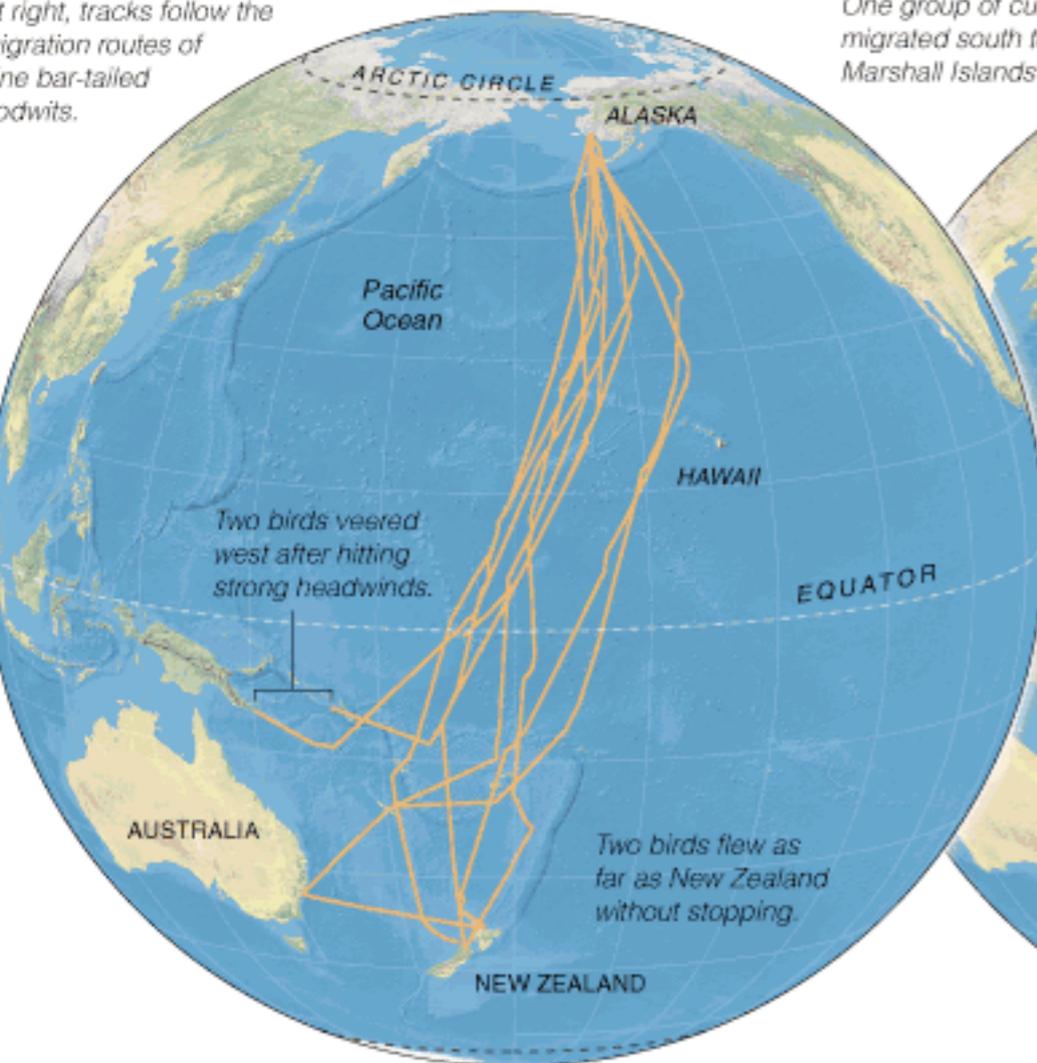
BRISTLED-THIGHED CURLEW

A protruding antenna is visible in the above photo of a bristled-thighed curlew, one of several birds from two populations in different areas of Alaska that were implanted with transmitters. Researchers found that each group flew nonstop to a different chain of Pacific islands.

ARCTIC TERN

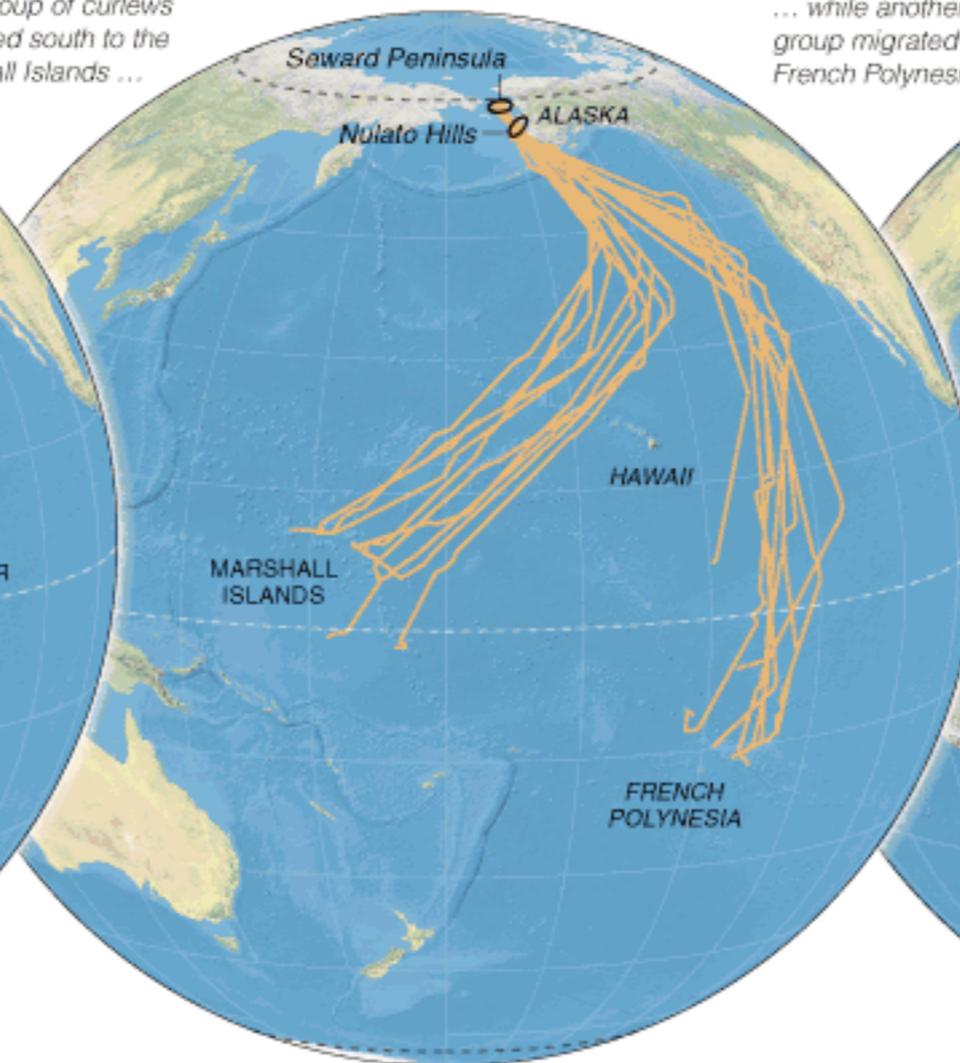Birds that are too small to carry an implant can be tracked with geolocators, tiny devices that record changing light levels. Tagged Arctic terns spent weeks diving for fish in the North Atlantic before flying south along the coast of Africa or South America.

OUTH FOR THE WINTER
t right, tracks follow the
igration routes of
ne bar-tailed
odwits.

TWO POPULATIONS
One group of curlews
migrated south to the
Marshall Islands …

… while another
group migrated to
French Polynesia.

RECORD DISTANCES
The Arctic tern has
the longest migratio
recorded, but
does not fl
nonstop
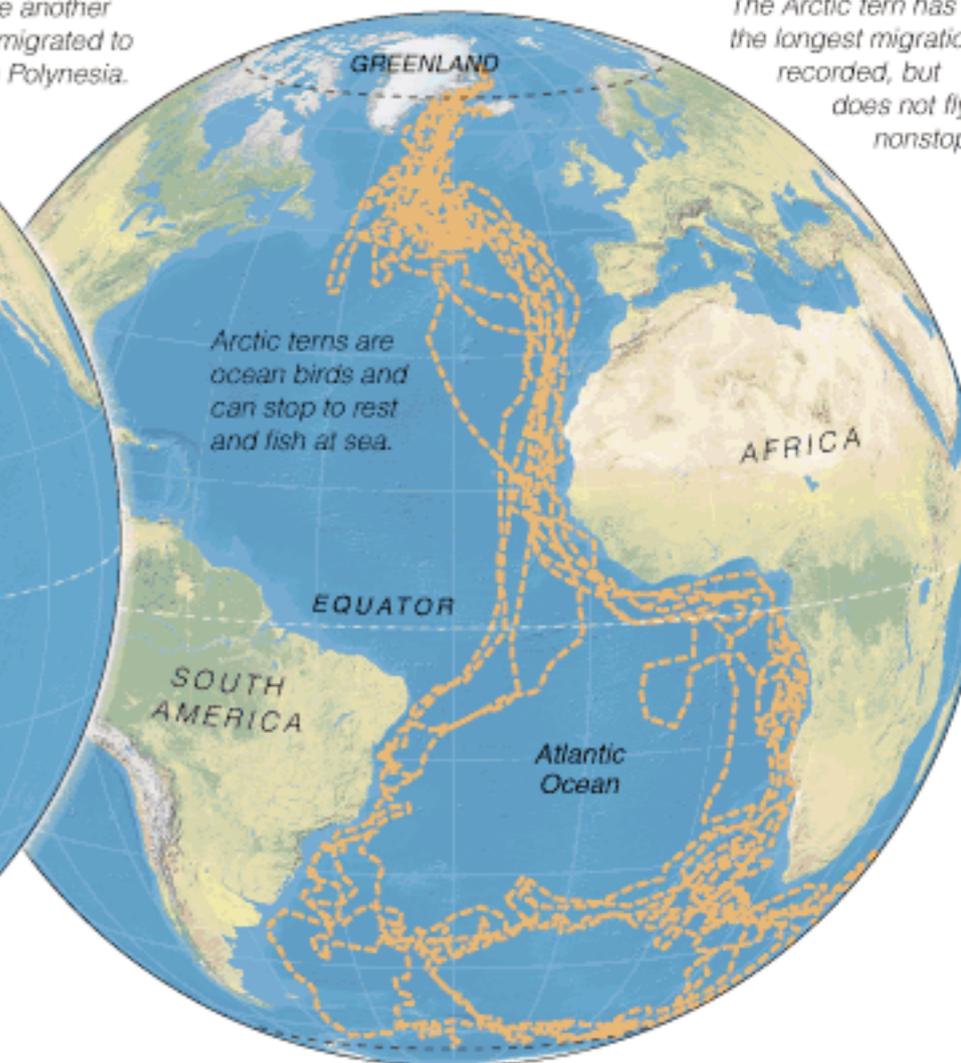
ARCTIC CIRCLE
ALASKA
Pacific
Ocean
HAWAII
EQUATOR
Two birds veered
west after hitting
strong headwinds.
AUSTRALIA
Two birds flew as
far as New Zealand
without stopping.
NEW ZEALAND

Seward Peninsula
Nulato Hills
ALASKA
HAWAII
MARSHALL
ISLANDS
FRENCH
POLYNESIA

GREENLAND
Arctic terns are
ocean birds and
can stop to rest
and fish at sea.
AFRICA
EQUATOR
SOUTH
AMERICA
Atlantic
Ocean

Text maps

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.

Amount a household must earn annually to be in the top 1% of a given metropolitan area

| $176,000 | $266,000 | **$380,000** | $458,000 | $908,000 |

LOWEST INCOME REQUIRED TO BE IN THE LOCAL 1%
Jamestown, N.Y.
$176,000

HIGHEST INCOME REQUIRED TO BE IN THE LOCAL 1%
Stamford, Conn.
$908,000

Bold indicates the 25 metropolitan areas with the **highest** and **lowest** incomes required to be in the local 1%

Dot-density maps

MAP KEY
One dot = 50 people
- White
- Black
- Hispanic
- Asian
- Other

Map data ©2012 Google, Sanborn · Terms of Use
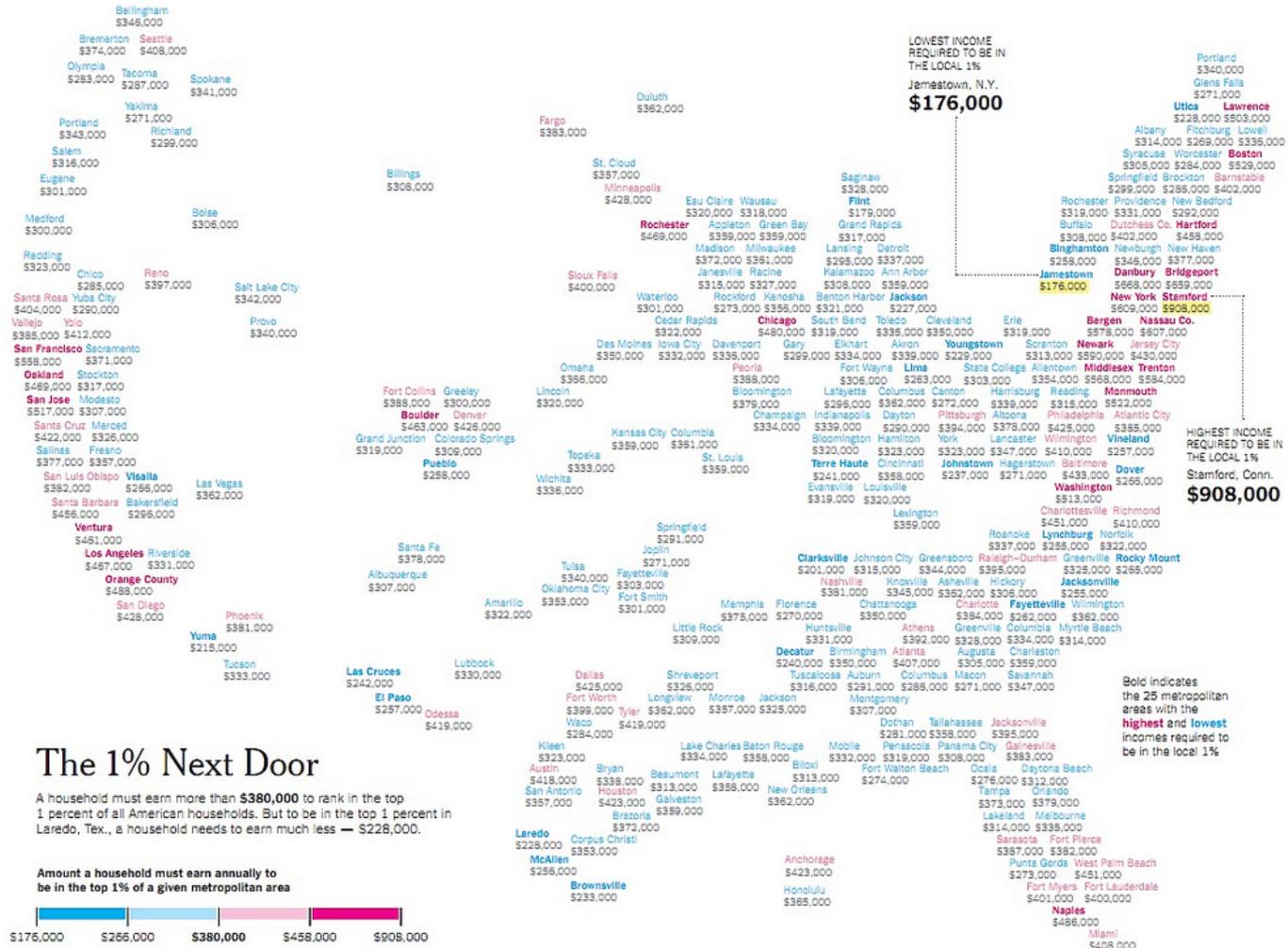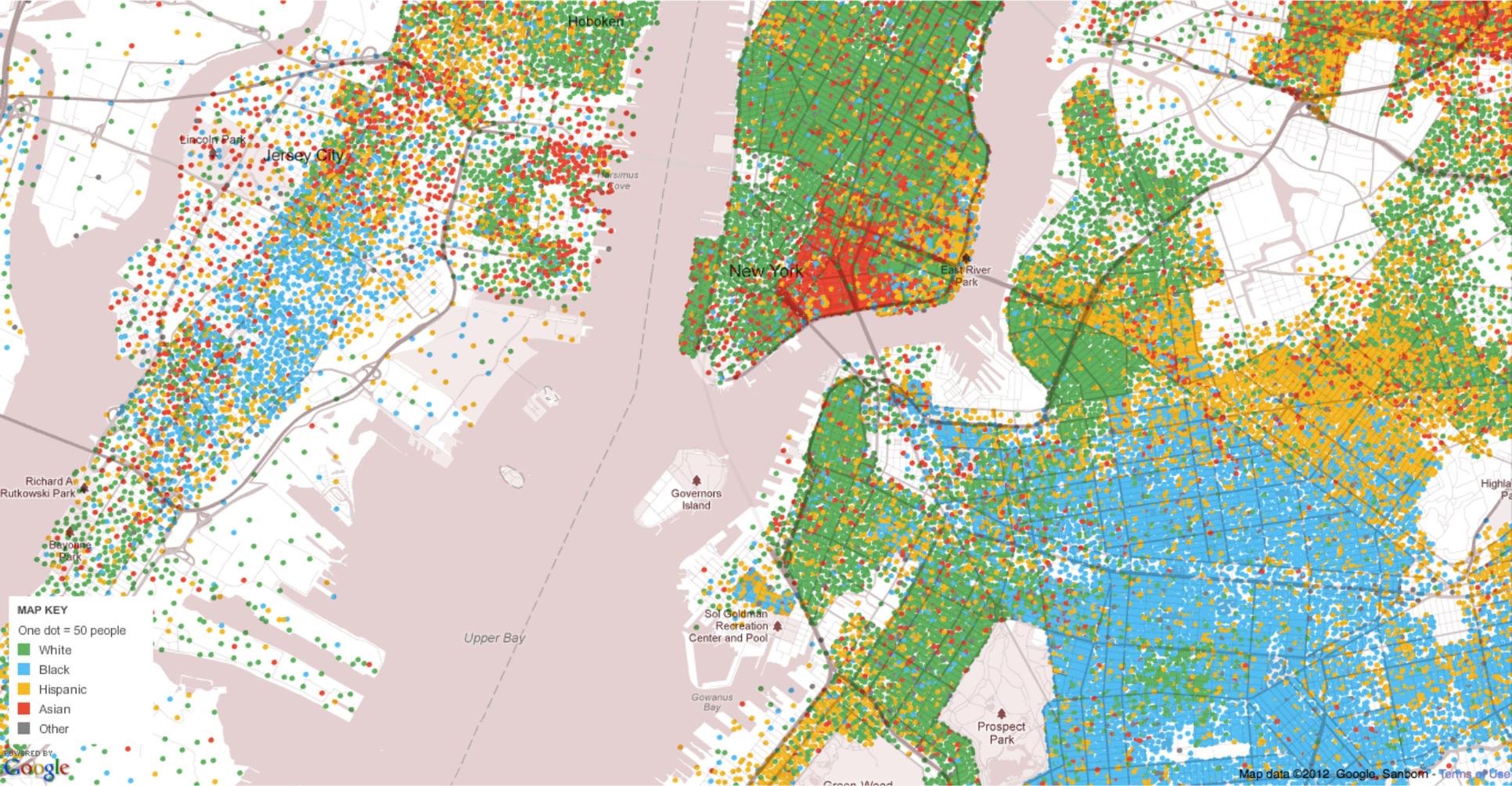
How Much Oil Is on the Gulf Coast

▶ Play   5/24 — 8/7   ◀ ▶   **Aug. 7**

LOUISIANA   MISSISSIPPI   ALABAMA   FLORIDA

Pensacola

New Orleans

Chandeleur Islands

Panama City

Mississippi Delta

G U L F   O F   M E X I C O

■ **Source of leaking oil**

100 MILES
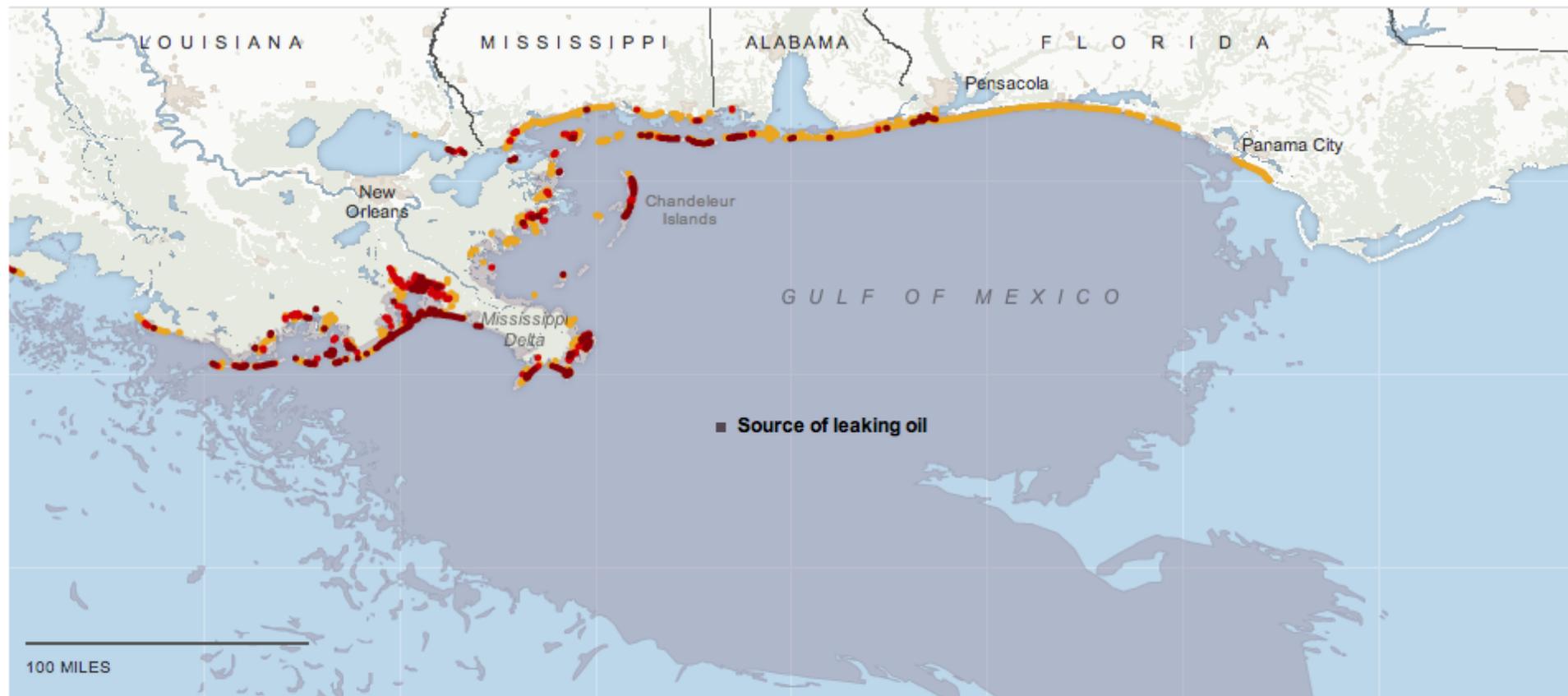
Map key | **Amount of oil found in federal surveys on each day**
— Heavy — Moderate — Light

Combined oil slick areas May 8 to Aug. 7
Marshes   Urban areas

🐦 For updates, follow us on Twitter @nytoilspillmap.

MAPPING GENERIC TERMS FOR STREAMS IN THE CONTIGUOUS UNITED STATES

Toponyms, or the names given to places, carry cultural information in their etymology and patterns of use. Generic toponyms, used to describe a general type of feature such as a *lake* or *pond*, tend to change more slowly than specific names. This map shows the distribution of the most popular* generic toponyms for streams in the United States. These names vary widely across America in their etymological roots, the types of features they refer to, and their cultural patterns of use. These variations reflect the interplay of cultural and physical factors that have influenced naming practices across the country.

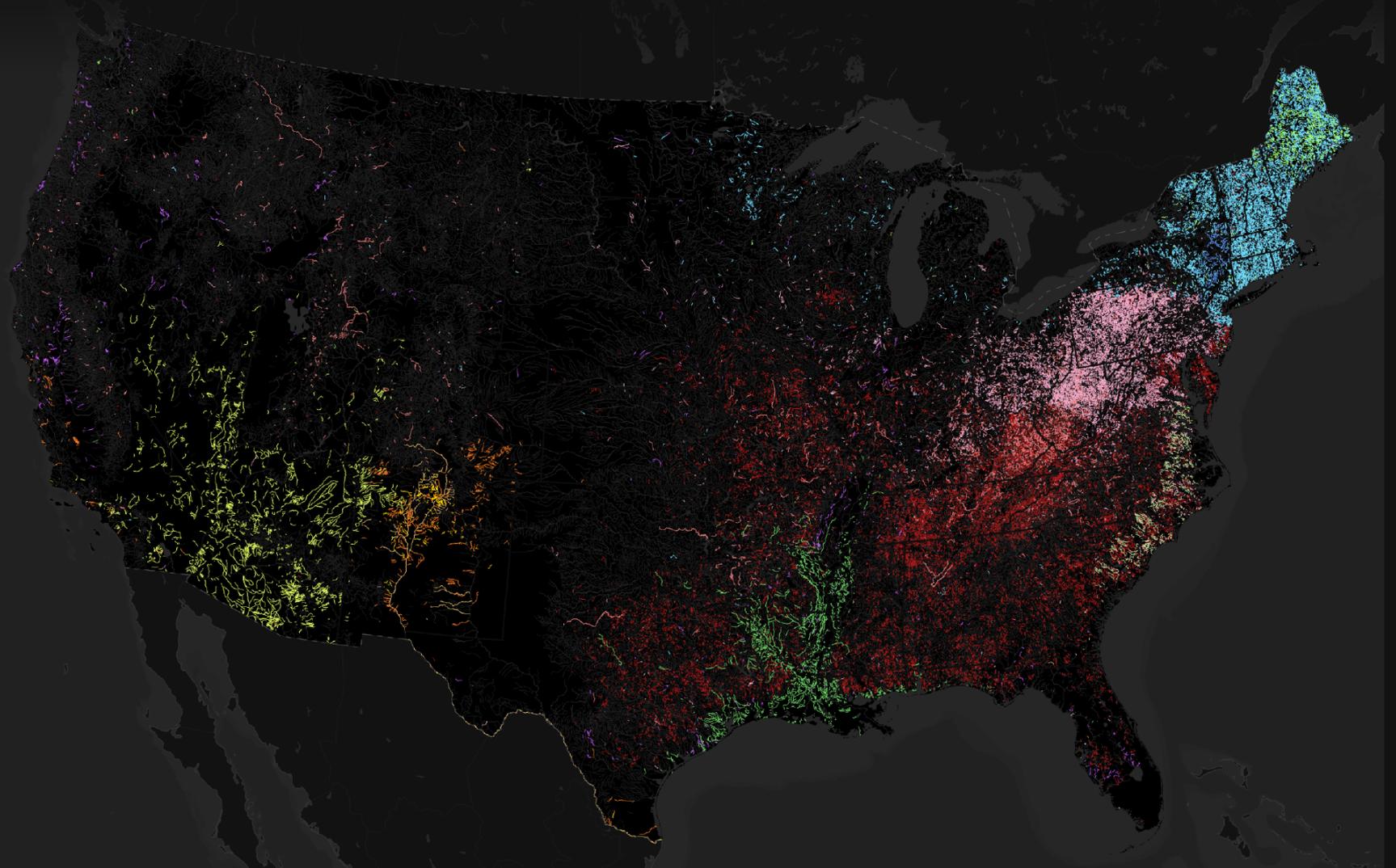BRANCH   RUN   FORK   BROOK   KILL   STREAM   BAYOU   SWAMP   SLOUGH   WASH   CAÑADA   ARROYO   RIO

* *River* and *creek* are the most common stream names in the United States, and appear as shades of gray on this map.

Laser Survey of a Maya City

A small aircraft flying back and forth above the ancient Maya city of Caracol, in Belize, used a laser to penetrate the dense forest canopy.

Viewed in three dimensions, the data revealed new ruins, causeways and agricultural terraces of the sprawling city. A detail of Caracol's city center is shown here.
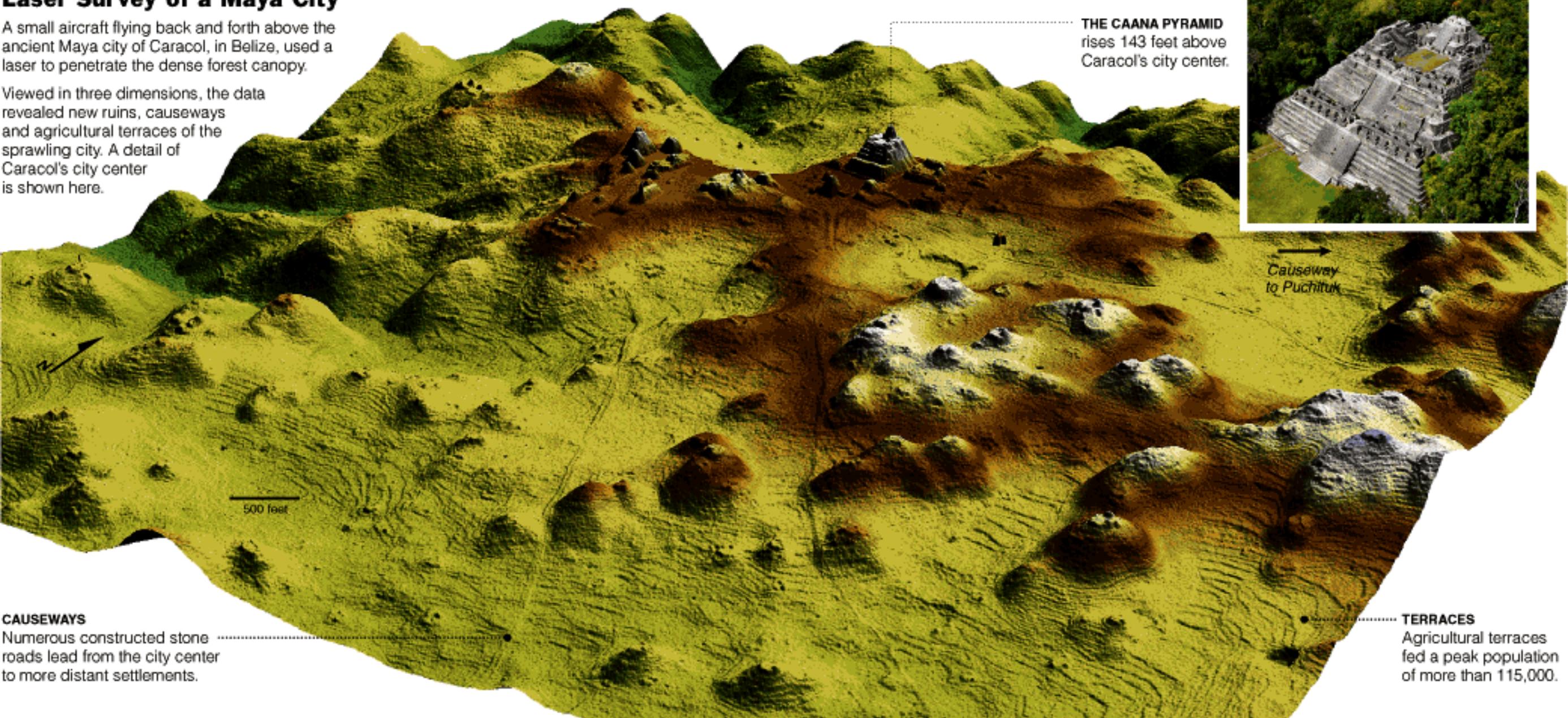
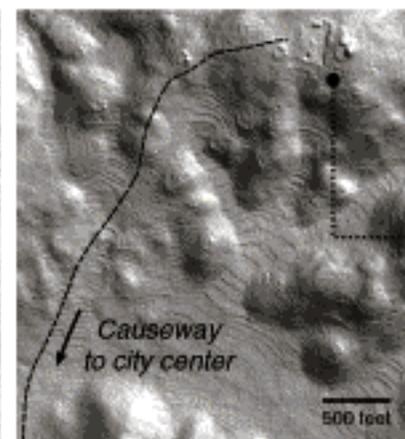**THE CAANA PYRAMID** rises 143 feet above Caracol's city center.

Causeway to Puchituk

500 feet

CAUSEWAYS
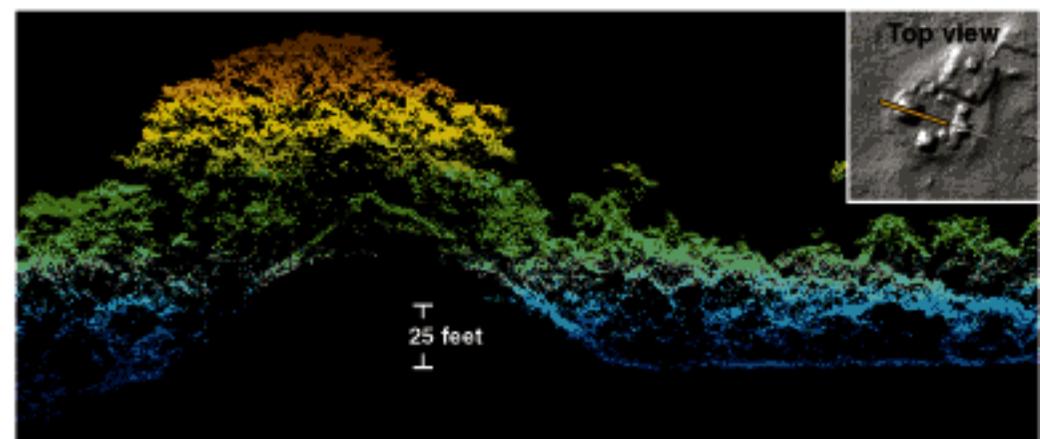Numerous constructed stone roads lead from the city center to more distant settlements.

TERRACES
Agricultural terraces fed a peak population of more than 115,000.

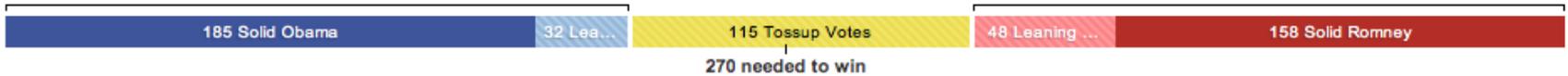**SATELLITE IMAGERY** from the Ikonos satellite is unable to penetrate heavy foliage.

LIDAR Using a laser instrument called lidar, for light detection and ranging, to scan the upper canopy shows little detail (left). But some of the laser pulses penetrate the foliage and reflect off the ground, revealing ruins and extensive terracing (right).

Causeway to city center

500 feet

PUCHITUK
Once surrounded by hundreds of open terraces, the hilltop settlement of Puchituk is now obscured by the forest.

Top view

25 feet

PEERING THROUGH THE FOREST A lidar scan along a straight track (orange line, inset) shows reflections off the ground and different layers of foliage, revealing the cross-section of a pyramid-shaped structure. In this image the measured points are colored according to height, and are accurate to about six inches.
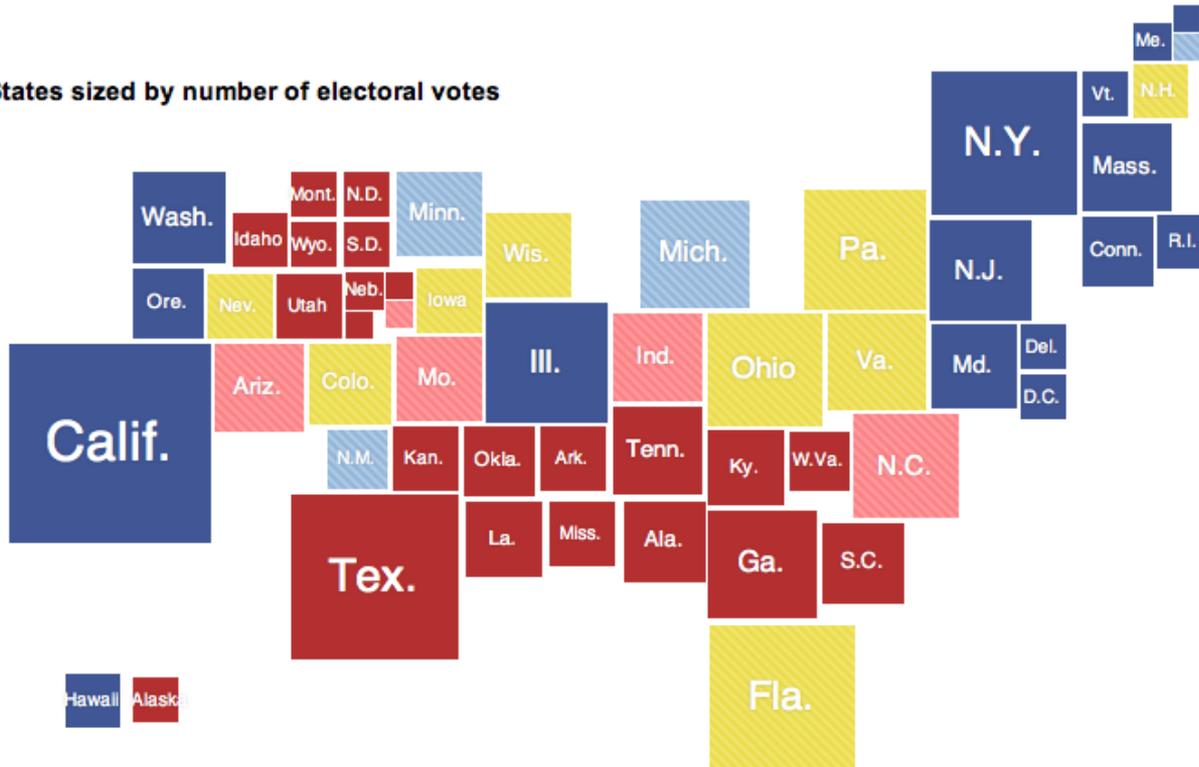
Source: Arlen F. Chase, Diane Z. Chase and John F. Weishampel, University of Central Florida

Cartograms

Maps don't have to be maps

The Tossups | *If you put the solid and leaning Democratic or Republican states into opposing bins, there are nine states where the election is likely to be decided.*

Obama
ELECTORAL VOTES **217** Needs 53 to win

115
Undecided

Drag circles

Needs 64 to win **206** **Romney**
ELECTORAL VOTES

Me.
N.Y.
Minn.
Vt.
Wash.
Mass.
R.I.
Mich.
Ore.
Conn.
Calif.
Ill.
N.J.
Del.
D.C.
Md.
Hawa
N.M.

Wis.
Pa.
Iowa
N.H.
Nev.
Ohio
Va.
Colo.
Fla.

S.D. N.D.
Mont.
Wyo.
Idaho
Neb.
Ind.
W.Va.
Utah
Mo.
Tenn.
N.C.
Ariz.
Kan.
Ark.
Okla.
Ky.
Alaska
S.C.
Ala.
Tex.
Ga.
La.
Miss.
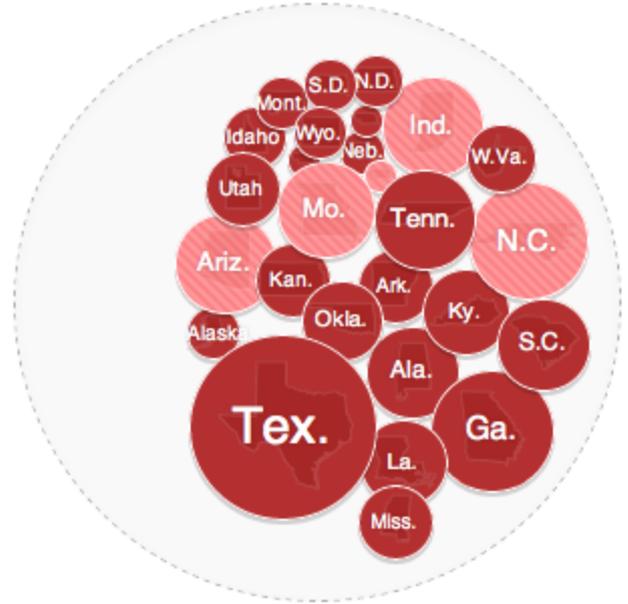
COLOR KEY ■ Solid Obama ■ Leaning Obama ■ Tossup ■ Leaning Romney ■ Solid Romney

If President Obama were to win all of the states above this line, he would need an additional 17 electoral votes from states below it in order to win in 2012.

Obama +20 percentage points

+40

+10

Margin of victory in 2008

+20 percentage points McCain

Hawaii
Vt.
R.I.
N.Y.
Del.
Ill.
Calif.
Md.
Mass.
Conn.
Mich.
Me.
Ore.
Wash.
N.J.
Wis.
N.M.
Pa.
Minn.
Nev.
N.H. 4
Ohio 18
Iowa 6
Colo. 9
Ind. 11 votes
Fla. 29
Va. 13
N.C. 15
Mo.
Ariz.
Mont.
S.C.
Ga.
S.D.
N.D.
W.Va.
Miss.
Neb.
Kan.
Ky.
Tenn.
La.
Tex.
Ark.
Ala.
Alaska
Idaho
Utah
Okla.
Wyo.

Circles are sized according to the number of electoral votes in 2012.

20%   25%   30%   35%

Percentage with bachelor's degrees or higher