

Communication Sketching

Minimal information to connect
with viewer schema

Straight Lines

keep the wrist stiff
draw from the shoulder
draw through
let the dot be your guide
draw away from the body
rotate the paper

Arcs

leverage your on the physiology

.... keep wrist stiff....

rotate at the elbow

kinetic memory

try contour lines

Circles

draw guide lines

ghost passes over the sheet

...keep your wrist stiff...

closing your eyes helps, maybe

Ellipses

plot major and minor axis

...ghost passes over the sheet...

draw from the shoulder

Patterns

use all the patterns

use dots to maintain distance

keep the wrist stiff

draw from the shoulder

Graphic Layouts

Use symbolic shapes to layout
graphics

Design & Data

0 1 0 1 0 1 0 0	0 1 1 0 1 0 0 0
0 1 1 0 1 0 0 1	0 1 1 0 1 1 1 0
0 1 1 0 1 0 1 1	0 0 1 0 0 0 0 0
0 1 1 0 0 1 0 0	0 1 1 0 1 0 0 1
0 1 1 0 0 1 1 0	0 1 1 0 0 1 1 0
0 1 1 0 0 1 0 1	0 1 1 1 0 0 1 0
0 1 1 0 0 1 0 1	0 1 1 0 1 1 1 0
0 1 1 1 0 1 0 0	0 0 1 0 1 1 1 0

Data does not equal information

**Data has to have a structure that is
meaningful to inform it's audience**

Category

Time

Location

Alphabet

Continuum

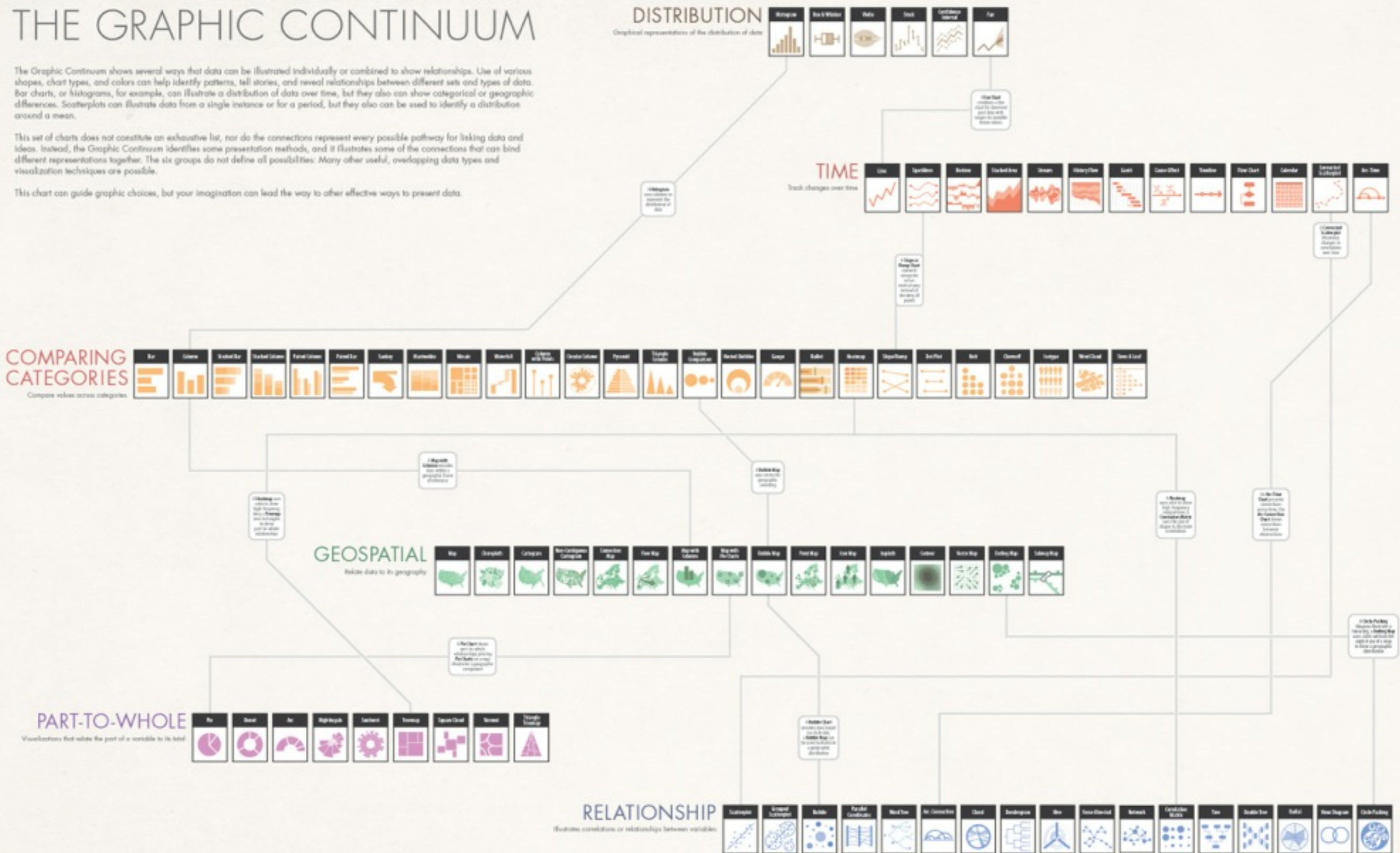
Information Anxiety by Richard Saul Wurman

THE GRAPHIC CONTINUUM

The Graphic Continuum shows several ways that data can be illustrated individually or combined to show relationships. Use of various shapes, chart types, and colors can help identify patterns, tell stories, and reveal relationships between different sets and types of data. Bar charts, or histograms, for example, can illustrate a distribution of data over time, but they also can show categorical or geographic differences. Scatterplots can illustrate data from a single instance or for a period, but they also can be used to identify a distribution around a mean.

This set of charts does not constitute an exhaustive list, nor do the connections represent every possible pathway for linking data and ideas. Instead, the Graphic Continuum identifies some presentation methods, and it illustrates some of the connections that can bind different representations together. The six groups do not define all possibilities. Many other useful, overlapping data types and visualization techniques are possible.

This chart can guide graphic choices, but your imagination can lead the way to other effective ways to present data.



DISTRIBUTION

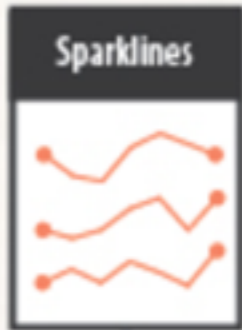
Graphical representations of the distribution of data



A Histogram uses columns to represent the distribution of data

TIME

Track changes over time



A Fan Chart combines a line chart for observed past data with ranges for possible future values

A Slope or Bump Chart connects categories across vertical axes instead of showing all points

TIME

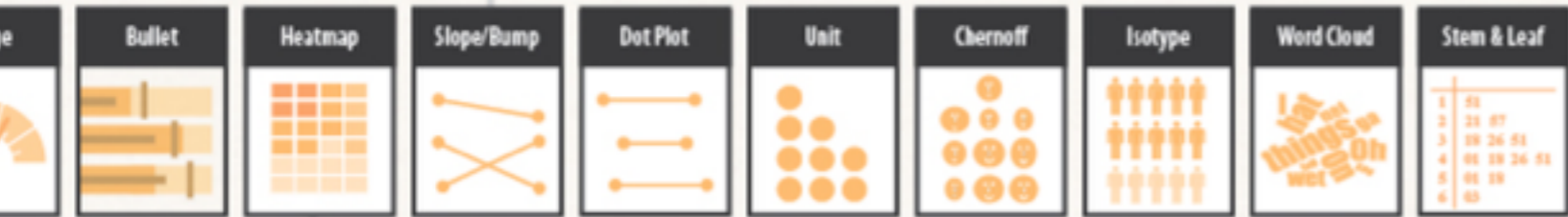
Track changes over time

A Fan Chart combines a line chart for observed past data with ranges for possible future values



A Slope or Bump Chart connects categories across vertical axes instead of showing all points

A Connected Scatterplot illustrates changes in correlations over time



COMPARING CATEGORIES

Compare values across categories



A Slope or Bump Chart connects categories across vertical axes instead of showing all points

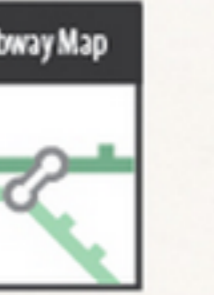
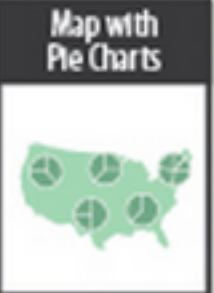


1	51
2	21 57
3	19 26 51
4	01 19 26 51
5	01 19
6	03

A Map with Columns encodes data within a geographic frame of reference

GEOSPATIAL

Relate data to its geography

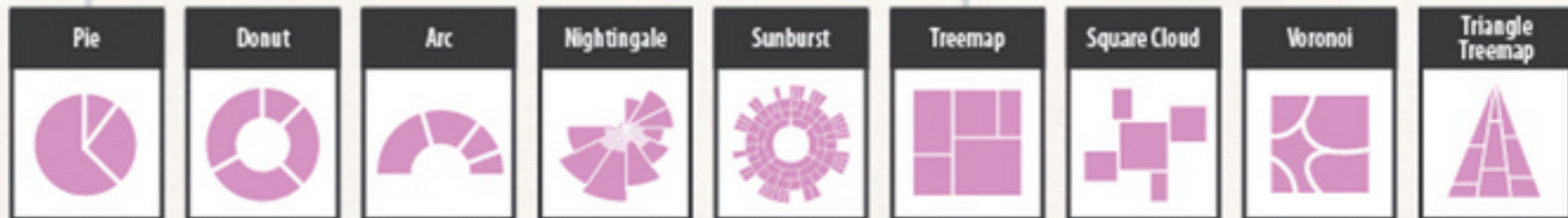


A **Pie Chart** shows part-to-whole relationships; placing **Pie Charts** on a map illustrates a geographic component

Full Image

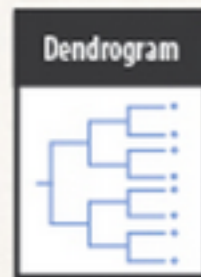
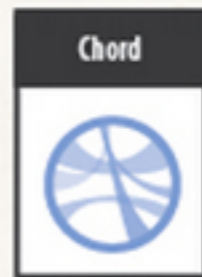
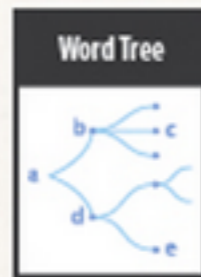
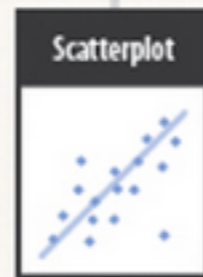
PART-TO-WHOLE

Visualizations that relate the part of a variable to its total




RELATIONSHIP

Illustrates correlations or relationships between variables

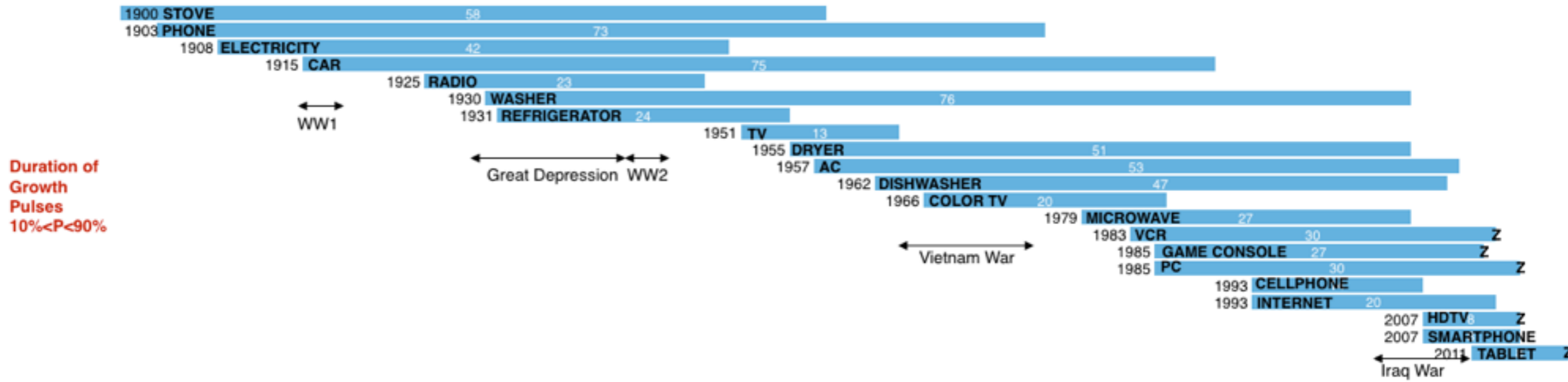
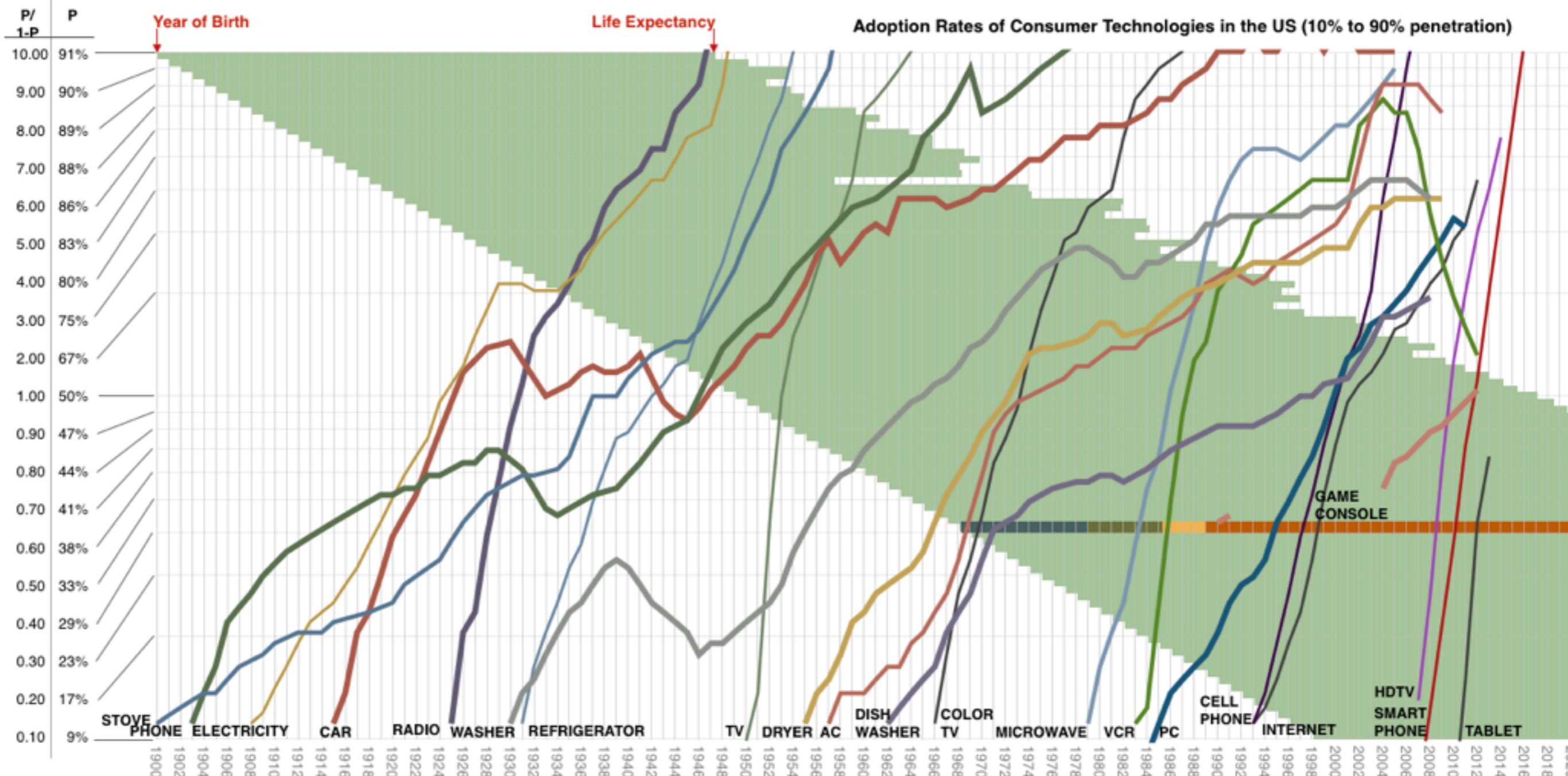


© Jonathan Schwabish & Severino Ribecca

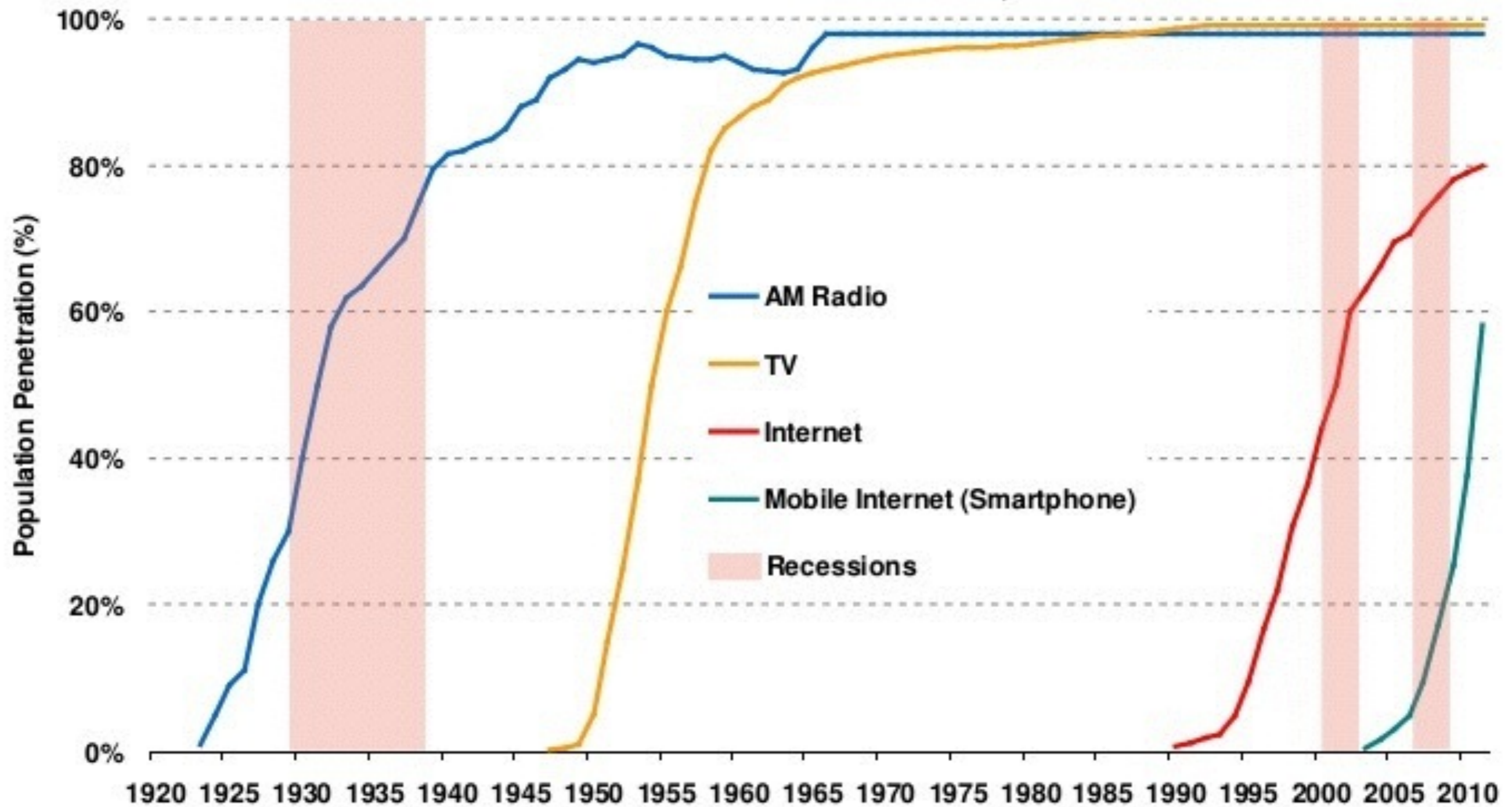
 @jschwabish @SR_Visual_Info

Ease of Use

Adoption Rates of Consumer Technologies in the US (10% to 90% penetration)



Technology Adoption (Measured by Population Penetration) in USA Radio vs. TV vs. Internet vs. Mobile Internet, 1920 – 2011E



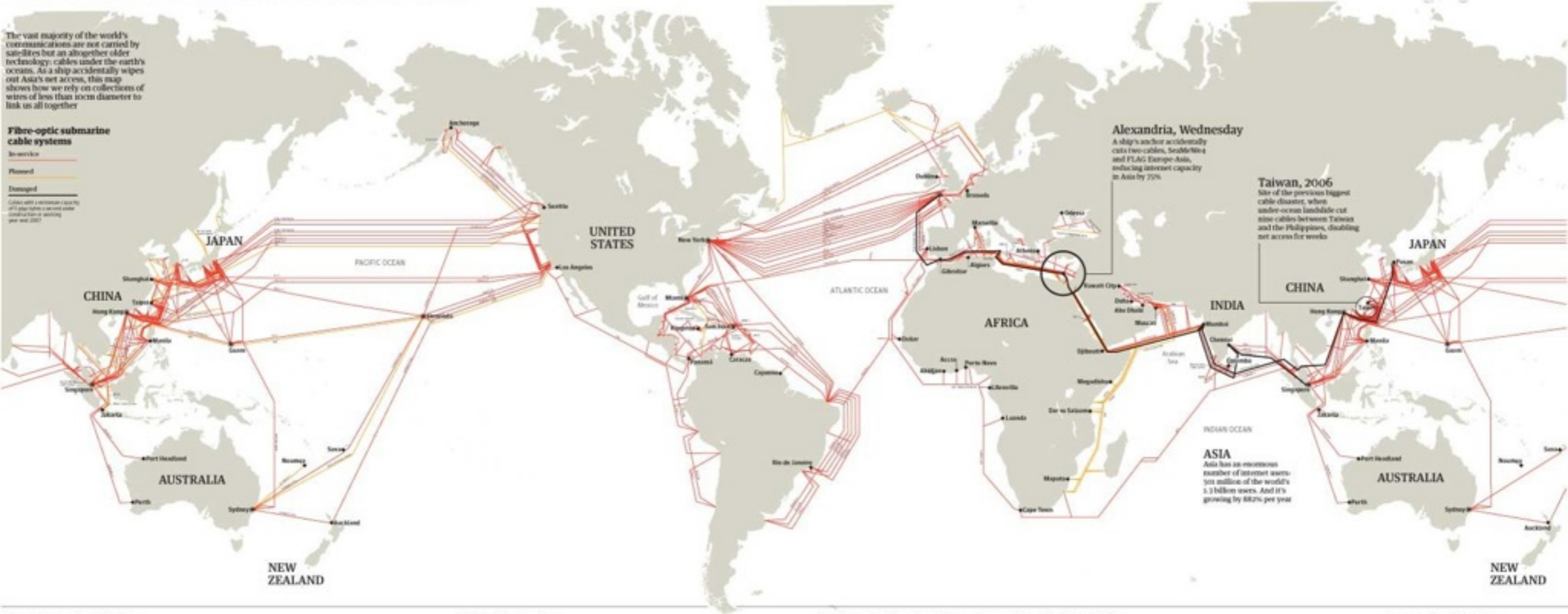
Source: Radio penetration data per Broadcasting & Cable Yearbook 1996, Internet penetration data per World Bank / ITU, Mobile Internet (smartphone) data per Morgan Stanley Research; 3G data per Informa.

The internet's undersea world

The vast majority of the world's communications are not carried by satellites but an altogether older technology: cables under the earth's oceans. As a ship accidentally wipes out Asia's net access, this map shows how we rely on collections of wires of less than 10cm diameter to link us all together

Fibre-optic submarine cable systems

In-service
Planned
Damaged
Cables with a maximum capacity of 10 Tbps (10,000,000,000,000 bytes per second) are shown in red.



Alexandria, Wednesday

A ship's anchor accidentally cuts two cables, SeaMeWe3 and FLAG Europe-Asia, reducing internet capacity in Asia by 20%

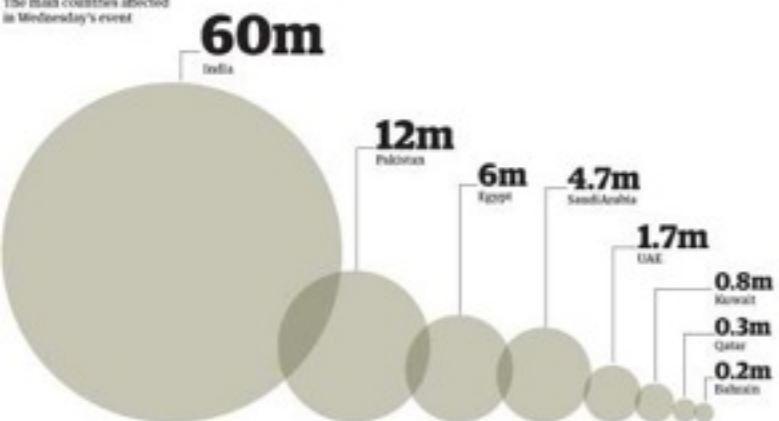
Taiwan, 2006

Site of the previous biggest cable disaster, when under-ocean landslide cut nine cables between Taiwan and the Philippines, disabling net access for weeks

ASIA
 Asia has an enormous number of internet users - 500 million of the world's 5.3 billion users. And it's growing by 80% per year

Internet users affected by the Alexandria accident

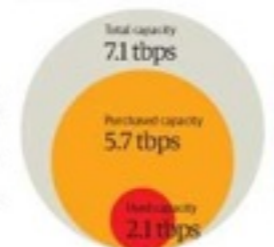
The main countries affected in Wednesday's event



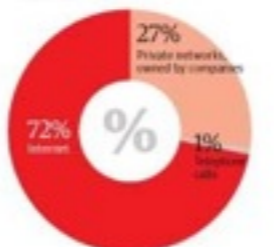
World cable capacity

Submarine cable operators light their own capacity on their systems to sell bandwidth to other carriers. Carriers buy extra capacity, mainly to hold in reserve. On the trans-Atlantic route 80% of the bandwidth is purchased, but only 20% is used

Capacity in terabytes a second



What makes up "used capacity"?



The longest submarine cables

The SeaMeWe-3 system from Norden in Germany to Seoul, South Korea connects 12 different countries with 35 landing points

Cable Name	Length (km)
SeaMeWe-3	20,000
Southern Cross	20,500
China-US	20,475
FLAG Europe-Asia	20,000
South America-1	25,000

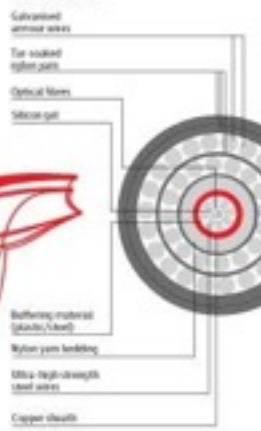
The world's cables in bandwidth

The first intercontinental telephony submarine cable system, TAT-1, connected North America to Europe in 1957 and had an initial capacity of 640,000 bytes per second. Since then, total trans-Atlantic cable capacity has soared to over 7 trillion bps



Cross-section of a cable

Cables of this strength are typically 60mm in diameter and weigh over 10,000 kilograms a kilometre. In deeper waters, lighter and less insulated cables are used

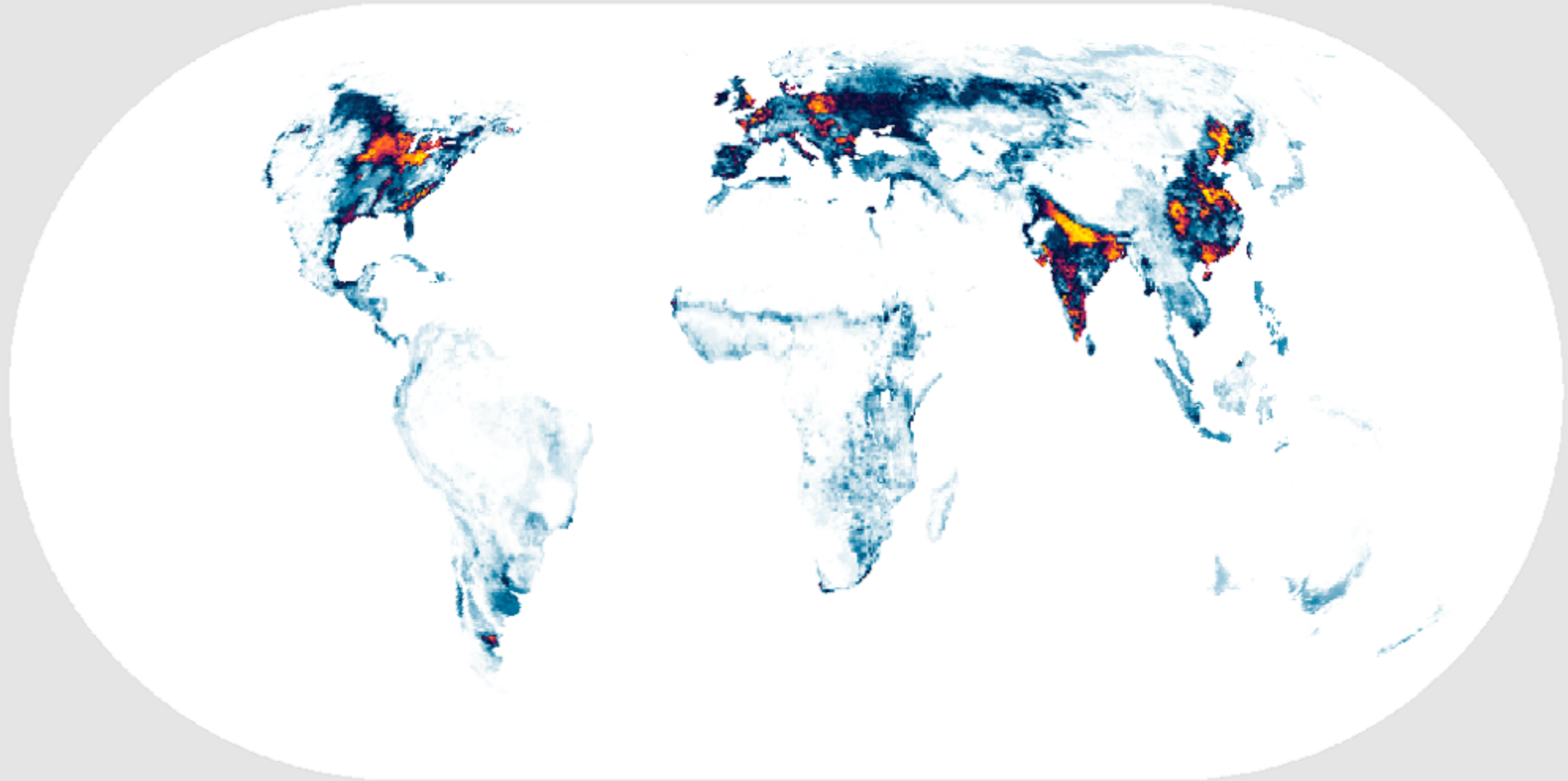


1700

1800

1900

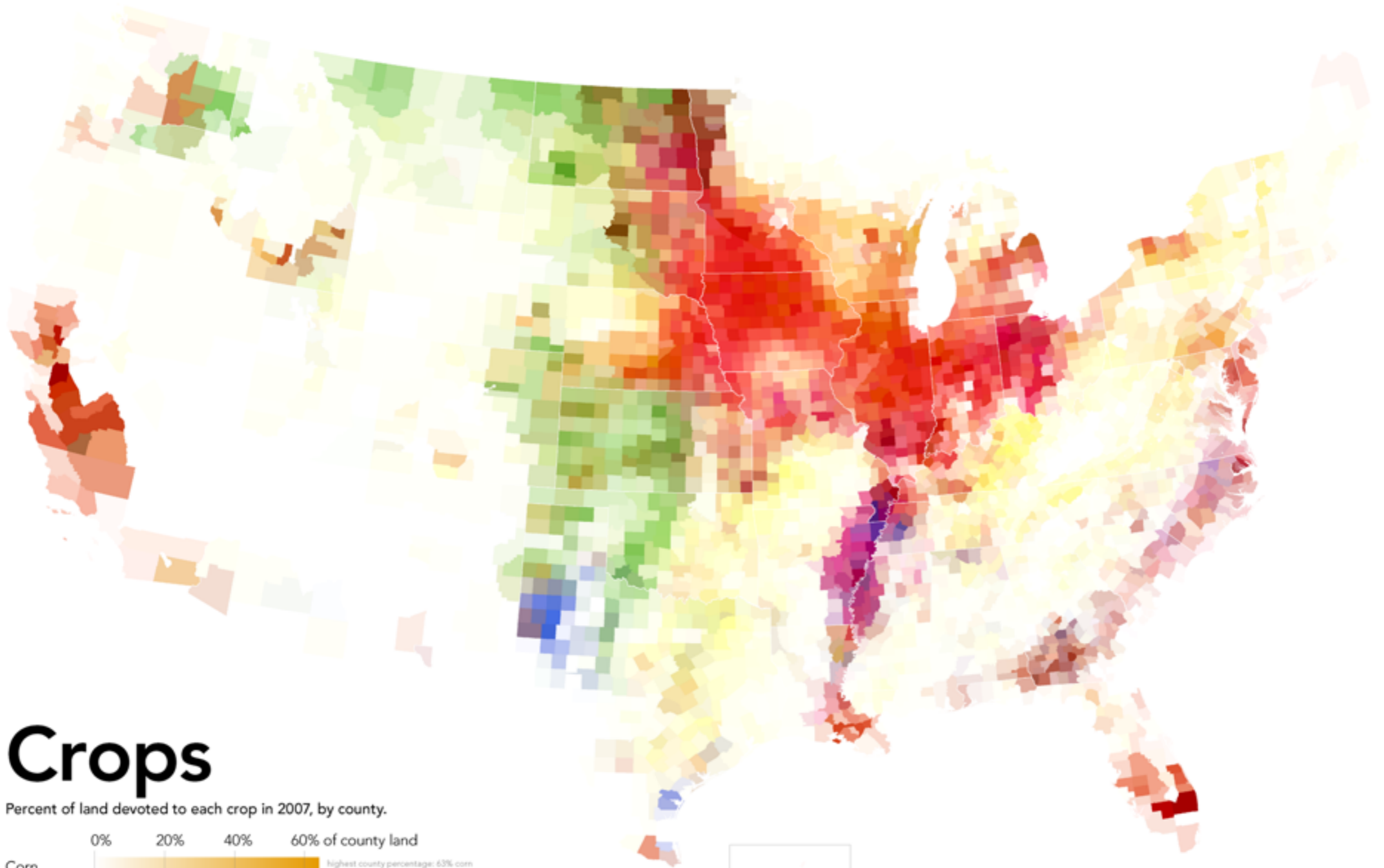
2000



percent of land used for growing crops

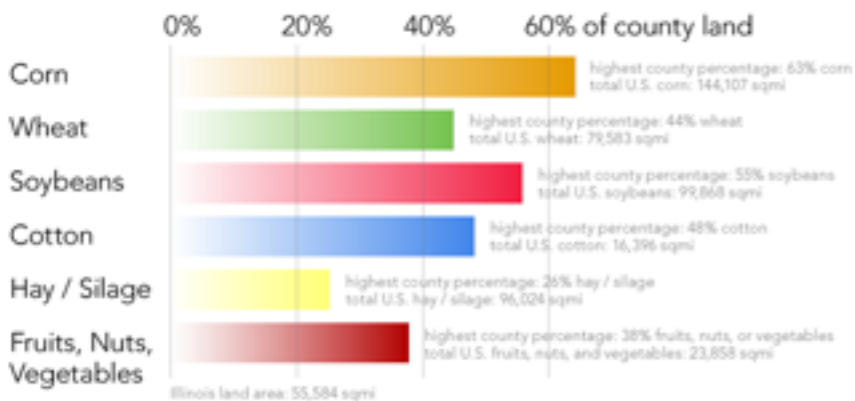


<http://www.radicalcartography.net/index.html?worldcrops>



Crops

Percent of land devoted to each crop in 2007, by county.

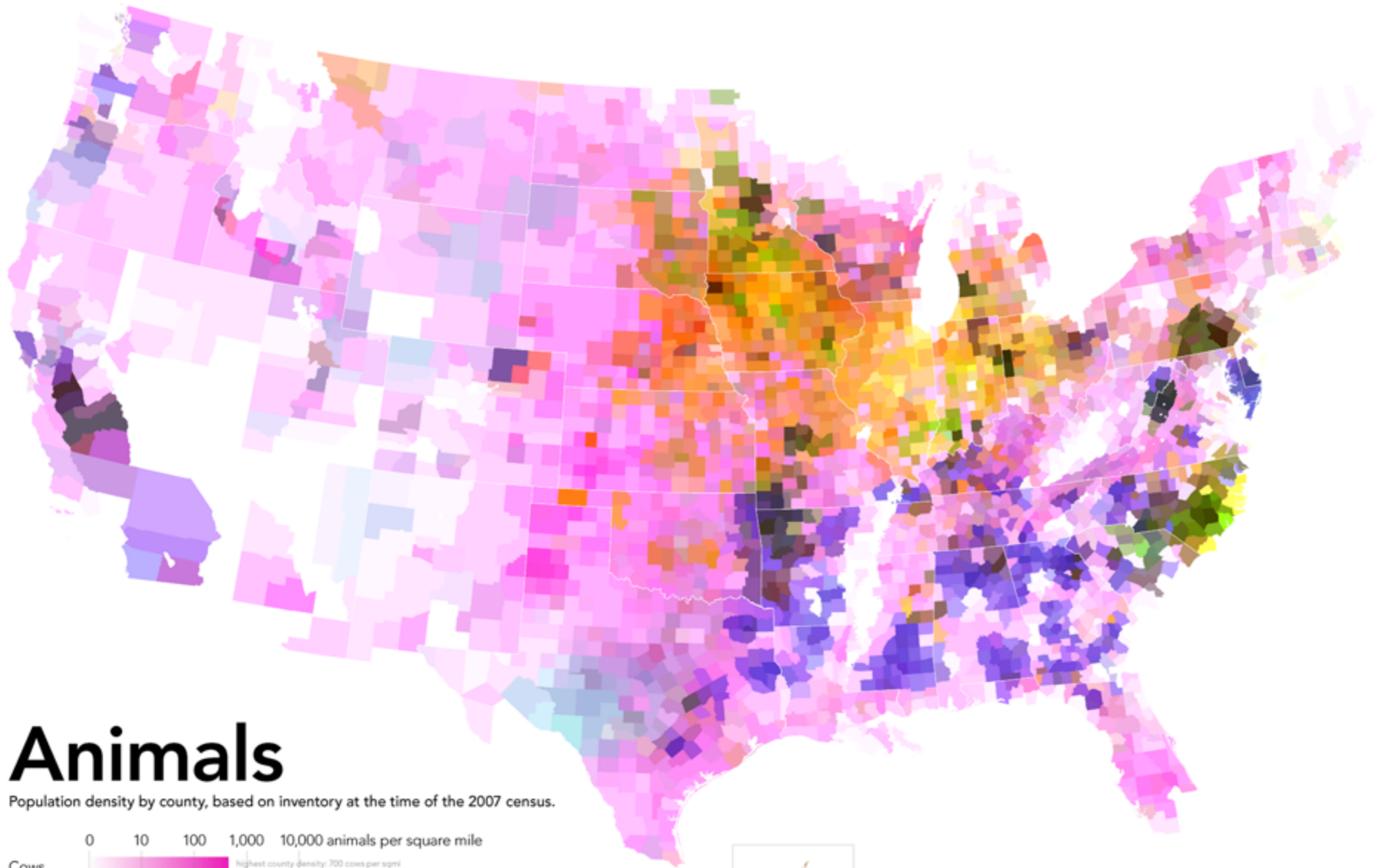


All maps shown at the same scale using equal-area projections. Data from the 2007 U.S. Census of Agriculture. Map by Bill Rankin, 2009.



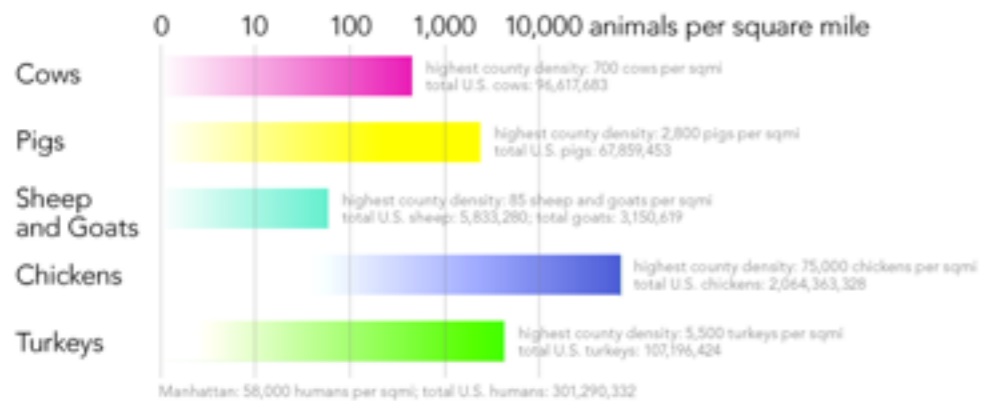
No cartographically meaningful agriculture in Alaska. Only inhabited islands shown.





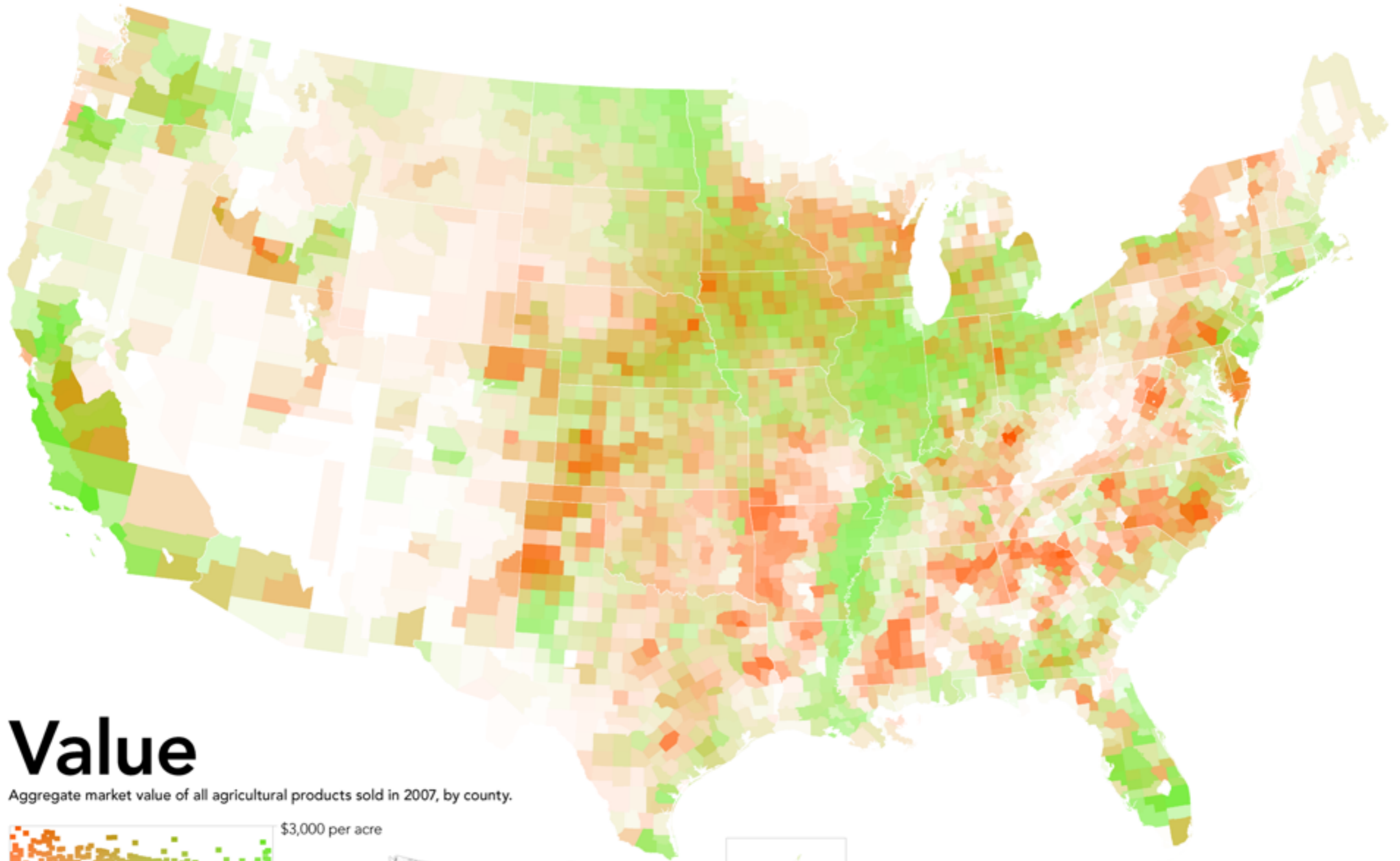
Animals

Population density by county, based on inventory at the time of the 2007 census.



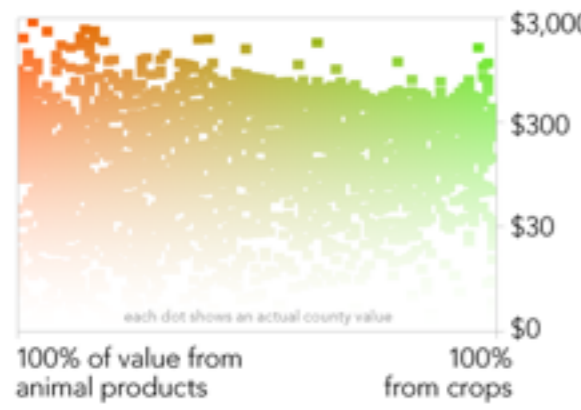
No cartographically meaningful agriculture in Alaska. Only inhabited islands shown.





Value

Aggregate market value of all agricultural products sold in 2007, by county.



Government payments as percent of market value.



No cartographically meaningful agriculture in Alaska. Only inhabited islands shown.



All maps shown at the same scale using equal-area projections. Data from the 2007 U.S. Census of Agriculture. Map by Bill Rankin, 2009.

Hierarchy Though Scale & Transparency

STATES VISITED



COUNTRIES VISITED



AIRMILES TRAVELLED

30,724

GERMAN AIRPORT EXPLORED

FRANKFURT

AIRPORTS VISITED

8

NUMBER OF FLIGHTS

11

AVERAGE FLIGHT DISTANCE IN MILES

2793

LOCATION BY DAY



DAYS EXCLUSIVELY IN MANHATTAN

304

MOST CONSECUTIVE DAYS IN MANHATTAN

40

10 MOST PLAYED ARTISTS



ITUNES TRACKS PLAYED

26,059

WWW.LAST.FM/USER/FELTRON

BEST ALBUMS

WHITE MAGIC DAT ROSA MEL APIBUS
FLYING LOTUS 1983
THOM YORKE THE ERASER

BEST NEW ARTIST

BATTLES

GENRE DISTRIBUTION OF 50 MOST PLAYED ARTISTS



DJ SETS PLAYED

49

MOST DJ-ED TRACK

52x

JAY-Z "DIRT OFF YOUR SHOULDER" (ACAPELLA)

CONCERTS ATTENDED

4

ELIOT LIPP AT APT
STEINSKI AT CAPONE'S
THE BOOKS AT NORTH 6TH
DAEDELUS AT APT

BEST LIVE PERFORMANCE

DAEDELUS

5 MOST PLAYED MIXES

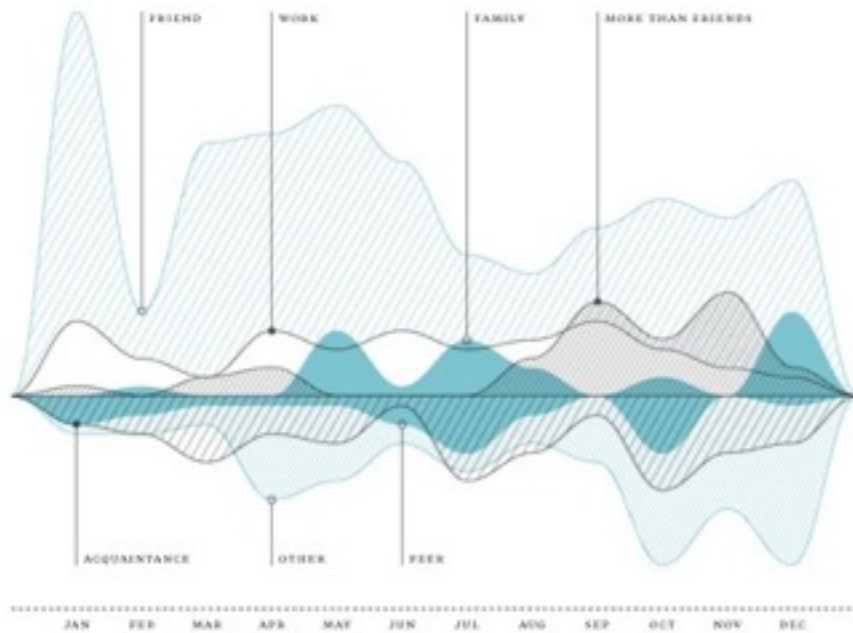
- COSMO BAKER: LEMON-RED FEB 06 WWW.LEMON-RED.ORG 19 PLAYS
- THE TAPE: MIXTAPE PART 2 WWW.THETAPE.DE 16 PLAYS
- DJ RAEO: APRIL 2006 WWW.RAEO.NET 15 PLAYS
- ELIOT LIPP'S ELECTRONIC BEATS PODCAST WWW.HEFTY.COM 8 PLAYS
- TAKE: PRESS ENTER WWW.INNERCURRENT.COM 7 PLAYS

* GREATER NEW YORK STATE ** QUEENS

Relationships

Reporting on the reporters.

FIGURE 3. RELATIONSHIPS REPORTED



SHORTEST RELATIONSHIP

5 Mins
ERIC, MAY 13

LONGEST RELATIONSHIP

Forever
ELINE, JAN 7

AVERAGE RELATIONSHIP DURATION

About 3 Years
3 YEARS, 3 MONTHS AND 22 DAYS

MOST COMMON RELATIONSHIP

Friend
134 REPORTS

STUDENT TO TEACHER RATIO

3:1
6 STUDENTS, 1 TEACHER AND 1 DRIVING INSTRUCTOR

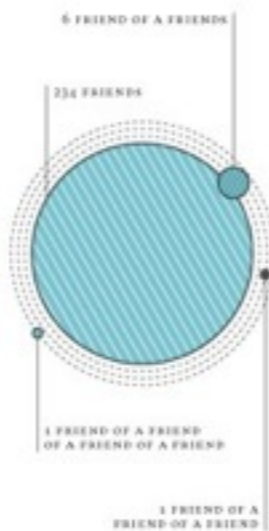
DISTINCT RELATIONSHIPS

179

NO RELATIONSHIP REPORTED

Eight

FIGURE 4. DEGREES OF FRIENDSHIP



QUESTION 1. WHAT IS YOUR RELATIONSHIP TO NICHOLAS?

- Friend / esteemed colleague.*
RYAN C., JANUARY 12
- Internet buddy.*
NOAH, FEBRUARY 18
- Grill master.*
WARREN, MAY 10
- Drinking buddy.*
HANA, JUNE 12
- Double-digit sociability.*
OLGA, SEPTEMBER 17
- Ex-wife.*
NICK B., OCTOBER 21
- Statistic.*
KEVIN L., DECEMBER 24
- Dentist.*
JOHN S., DECEMBER 23

QUESTION 2. HOW LONG HAVE YOU KNOWN NICHOLAS?

- A year, come February 22.*
ELISE, JANUARY 26
- Since Summer 2004.*
MARGARET, FEBRUARY 6
- 17 days at the time of recording.*
IAN A., MARCH 14
- About three hours*
AGE JET 170, APRIL 3
- 5 years, my whole life.*
JESSAN, APRIL 12
- Sixty four days.*
JESSICA R., APRIL 19
- Since birth.*
CAROL, MAY 15
- Since I was a teenager? Could that be?*
MARIANA, SEPTEMBER 1
- Years... I'm bad with time.*
MELISSA, NOVEMBER 20

Activities

The length and habits of an encounter.

FIGURE 5. AVERAGE LENGTH OF AN ENCOUNTER

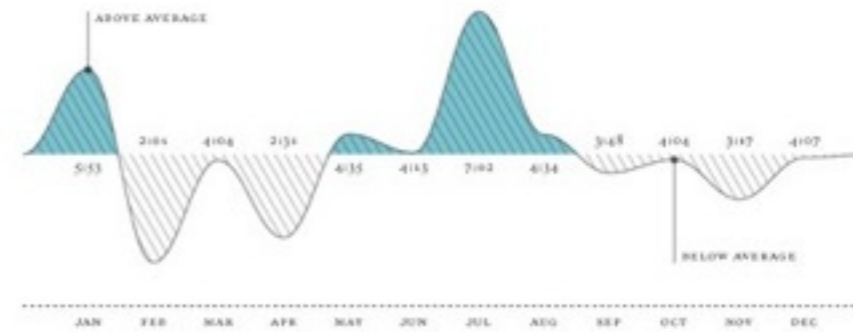
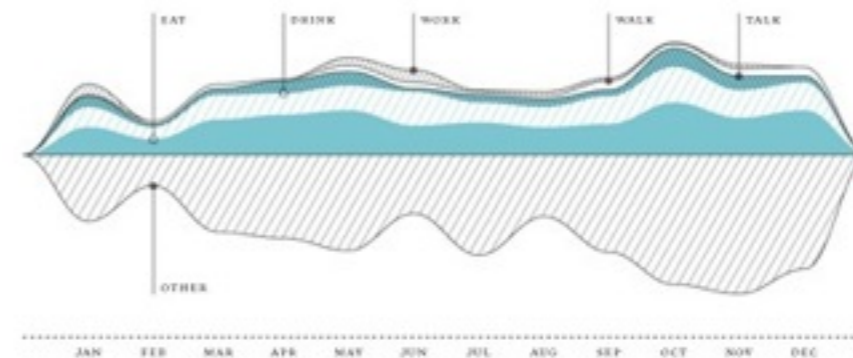


FIGURE 6. FREQUENTLY REPORTED ACTIVITIES



CUMULATIVE REPORTING TIME

Three Months
99 DAYS, 6 HOURS AND 17 MINUTES

MOST FREQUENT ACTIVITY

Dinner
105 REPORTS

AVERAGE ENCOUNTER LENGTH

Four Hours
4 HOURS, 15 MINUTES AND 13 SECONDS

MOST ACTIVITIES IN A MONTH

157
OCTOBER

GOING TO DANCING RATIO

5:4

AVERAGE ACTIVITIES PER ENCOUNTER

2.3

INSTANCES OF LAUGHTER

14

QUESTION 3. APPROXIMATELY HOW LONG WAS YOUR ENCOUNTER?

- A total of about 60 minutes.*
LORI, JANUARY 7
- 10am-11pm on 03/26/09.*
MIKI, MARCH 26
- 900 seconds.*
CHRISTOPHER E., APRIL 2
- 3 hours (they always seem to be 3 hours!)*
DANNIS, JUNE 19
- Personal - 7 mins; Impersonal - 35 mins.*
ANDREW K., AUGUST 19
- 7 hours 30 minutes.*
MARINA F., DECEMBER 24

QUESTION 4. WHAT ACTIVITIES DID YOU AND NICHOLAS PARTICIPATE IN?

- Drinking, in a social sense.*
KRIS, JANUARY 7
- A walk to the peak, riding roller coasters at Ocean Park, browsing for books.*
DANIELLE, JANUARY 15
- Conversation, light computer use.*
NICK S., MARCH 31
- Champ champ champ.*
GORDON, MAY 18
- Ate crabs, drank, watched fireworks, got ice cream.*
ANDREW L., JULY 10
- Reviewing work.*
MIKE A., AUGUST 12
- Waiting for a plane.*
GIBSON, OCTOBER 23
- Studio tour; business meeting.*
WILLY, NOVEMBER 13

CNN.COM LAUNCHED AUGUST 30, 1995

PAGE VIEWS MAY 1, 1996 - SEP 30, 2009

121,853,965,311

DAY WITH MOST AVERAGE PAGE VIEWS

SEP. 12

DAY WITH LEAST AVERAGE PAGE VIEWS

DEC. 25

LARGEST LIVE VIDEO EVENT

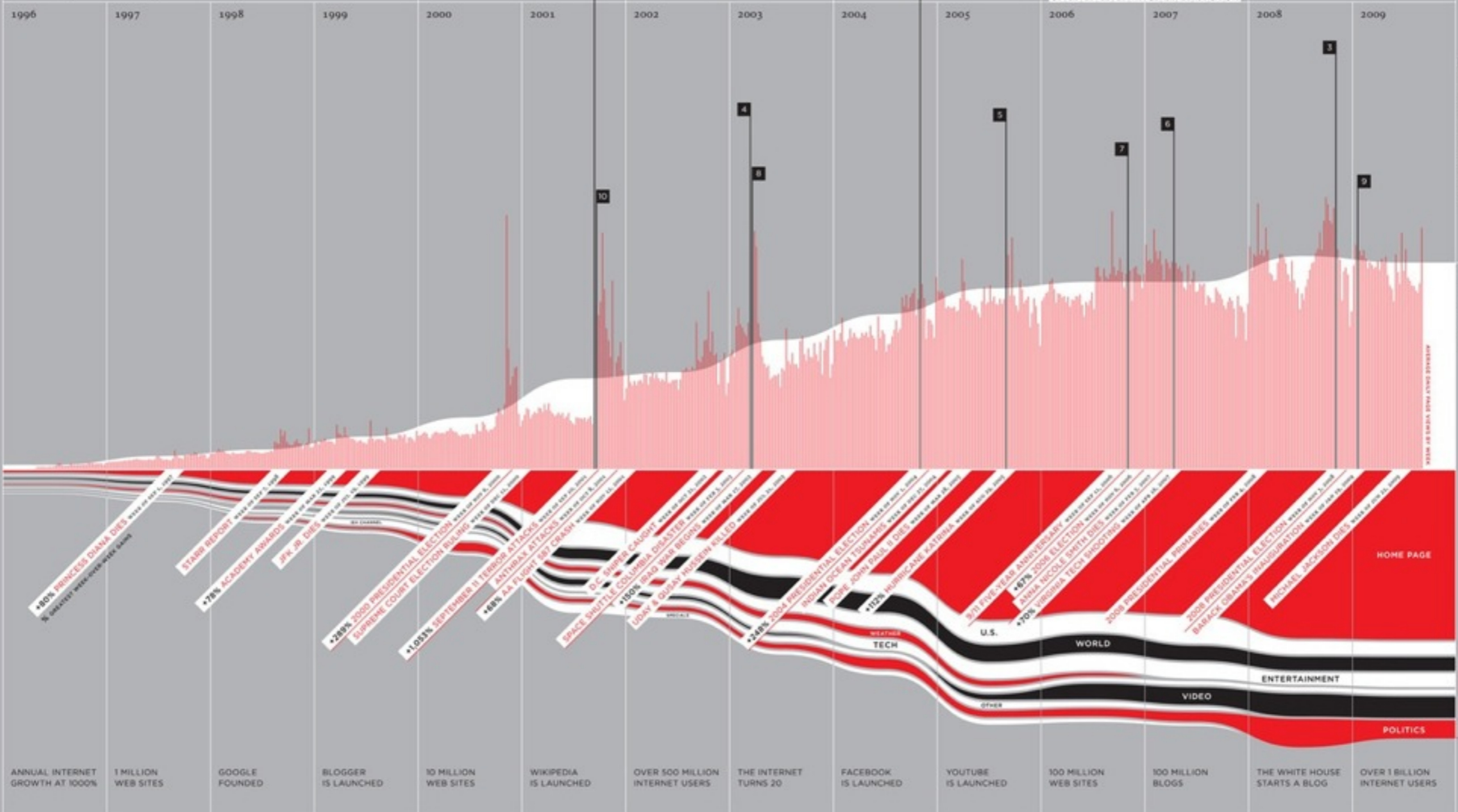
INAUGURATION DAY 2009

GLOBAL INTERNET USE 1997 - 2008



NATIONS VISITING CNN.COM, SEP 2009

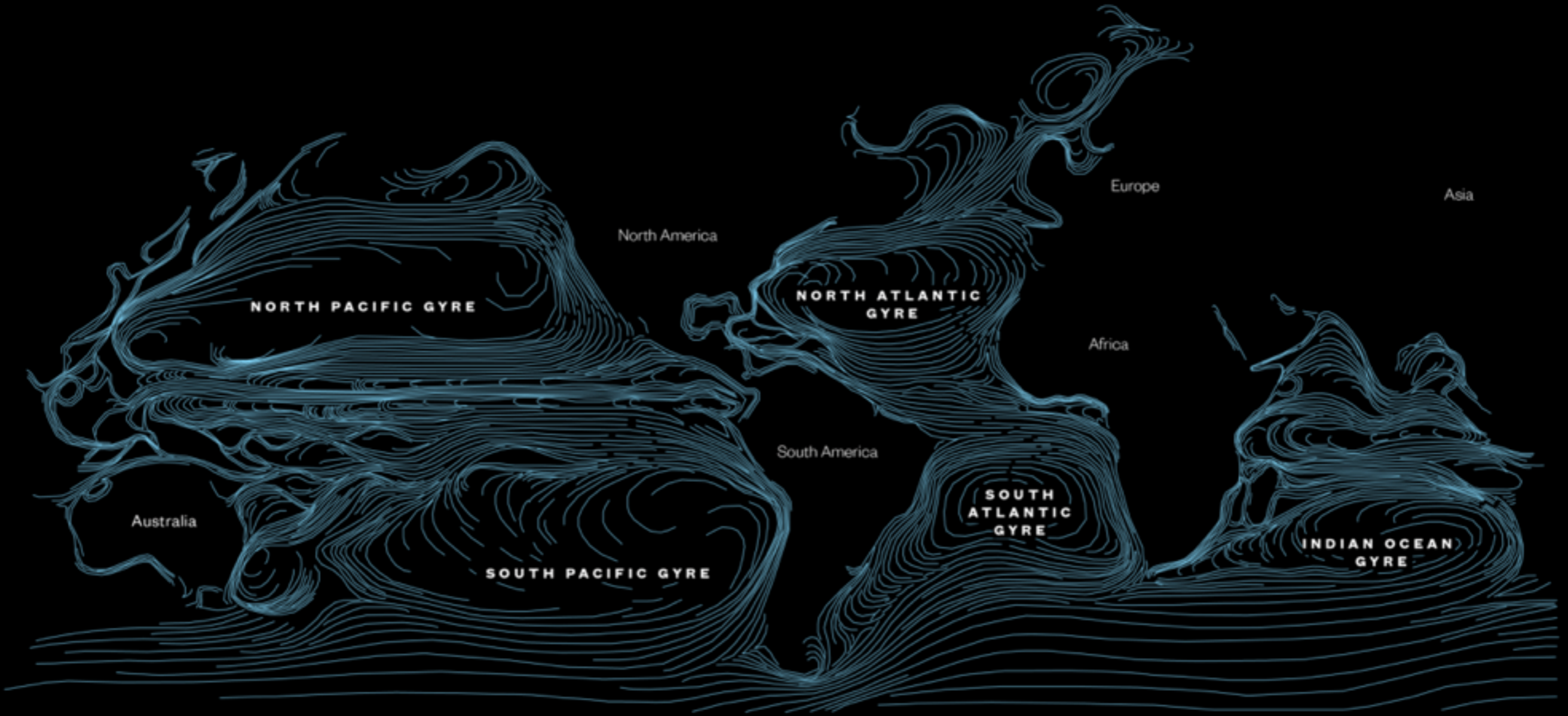
192



SOURCES: WEBSITE INTERNAL SERVER LOGS PRIOR TO AUG 2001; ORNITURE SITE CATALYST AUG 2001 FORWARD; TURNER RESEARCH FROM INTERNATIONAL TELECOMMUNICATIONS UNION (2006) FOR INTERNET USERS; UNITED NATIONS POPULATION DIVISION (2004) FOR POPULATION; AT&T LABS RESEARCH, NIELSEN ONLINE, AND BARNER RESEARCH

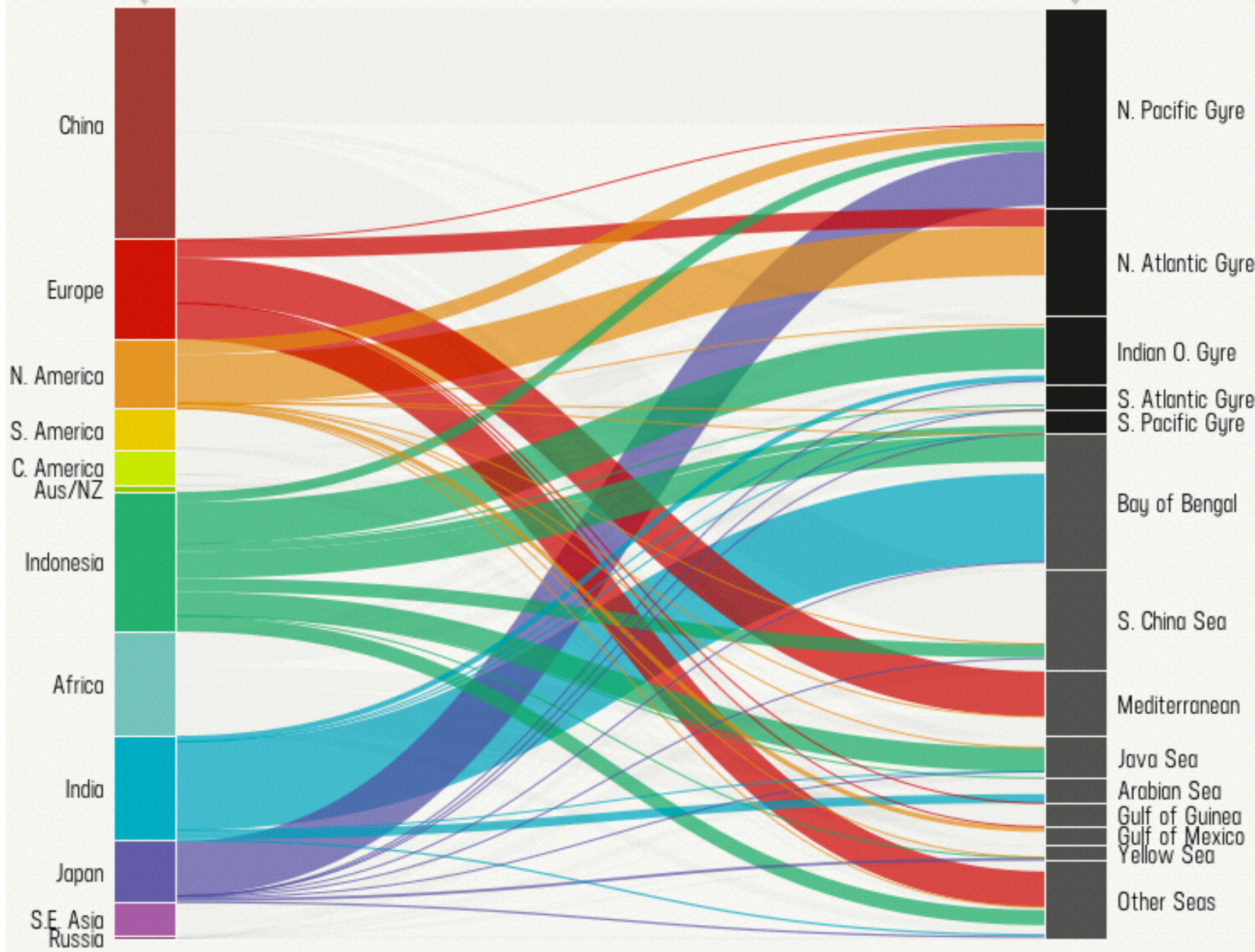
DESIGN: JEFFREY MAYER FOR CNN.COM

Strive for truth not beauty



SELECT A SOURCE

SELECT A GYRE



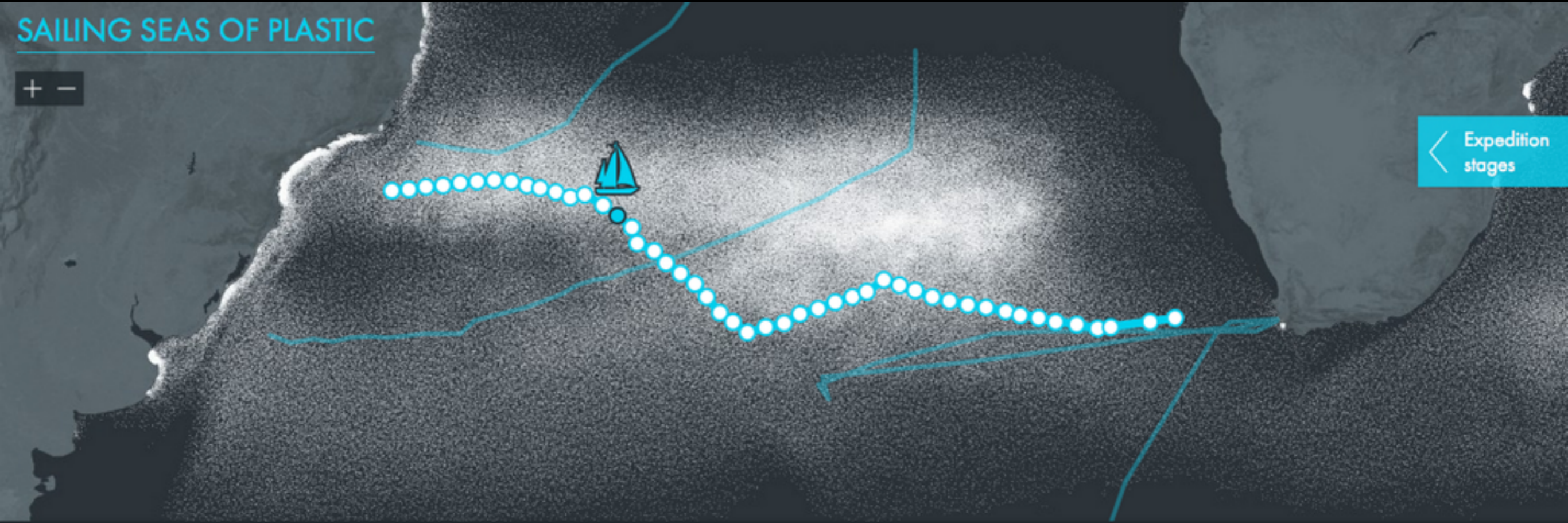
Areas by plastic debris

Gyres by Size

SAILING SEAS OF PLASTIC

+ -

Expedition stages

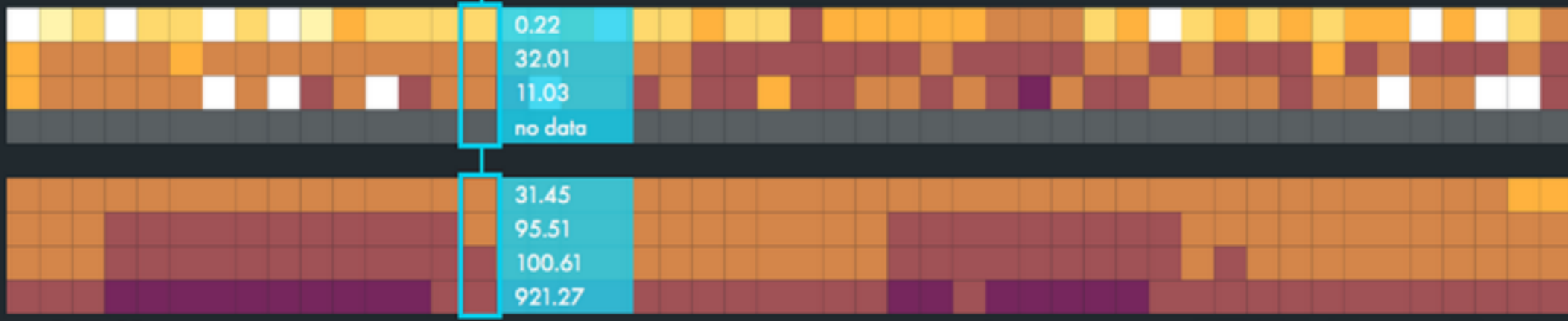


EXPEDITION 5 Gyres - Eriksen M. | 2010(b)

Count Density (pieces/km²)
Weight Density (g/km²)
Switch between

- 48 Locations
- 0.33 - 1.00
- 1.00 - 4.75
- 4.75 - 200
- > 200
- Size (mm) ↑↓
- 0.33 - 1.00
- 1.00 - 4.75
- 4.75 - 200
- > 200

19/11/2010 | 27.88° S, 25.90° W



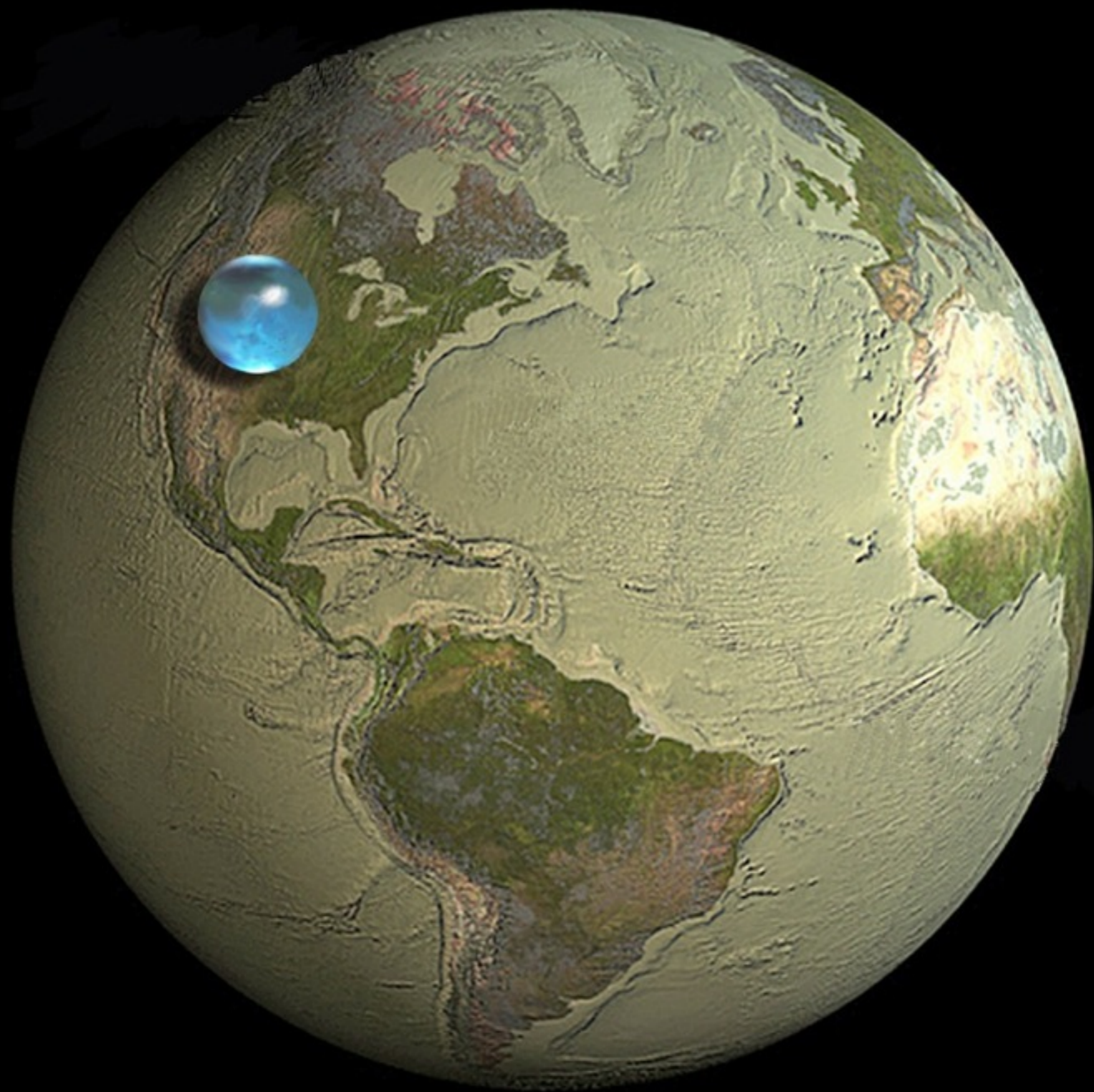
Weight Density (g/km²) 0 >1,000 No data

LEARN MORE

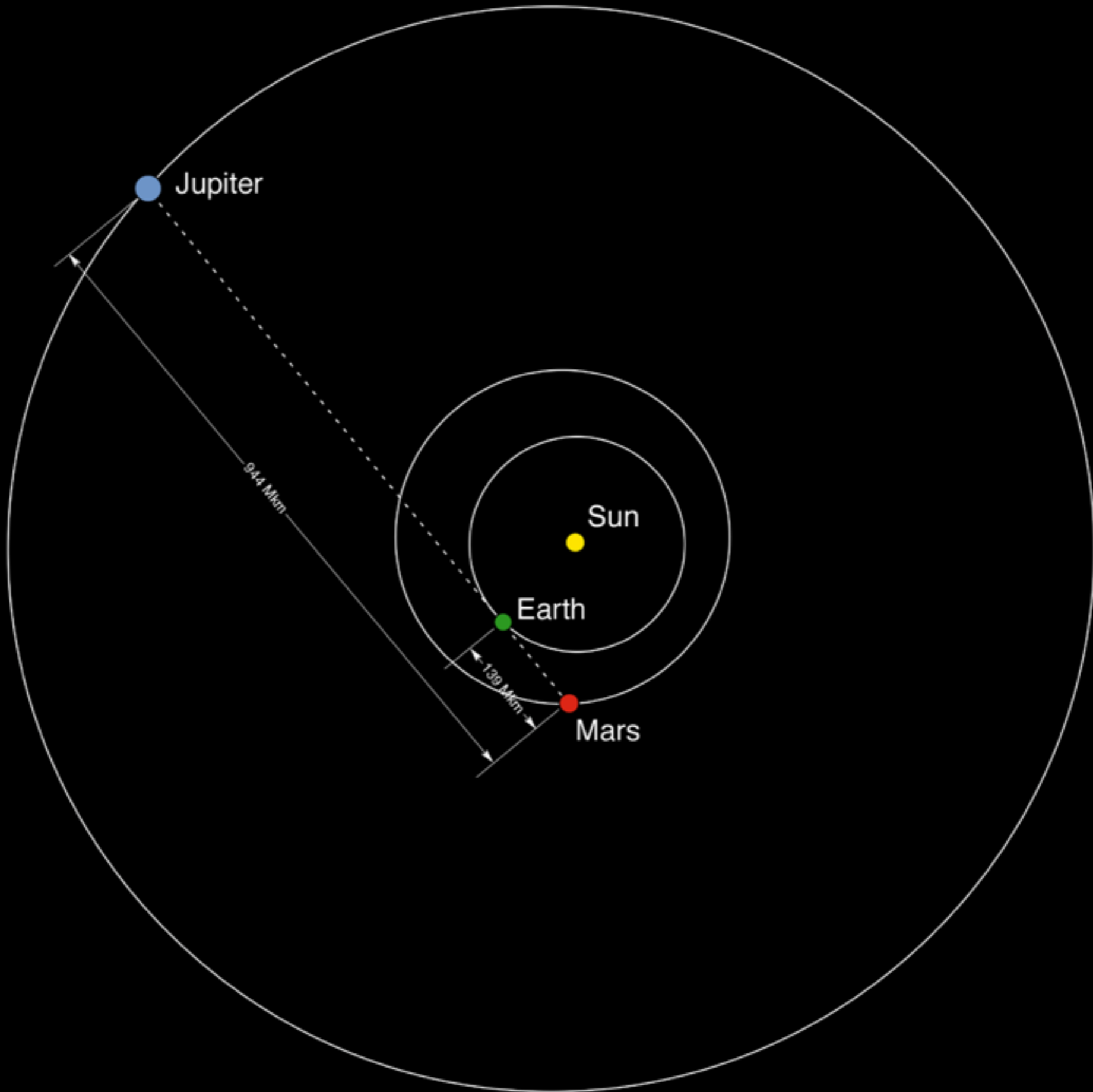
Credits | a data visualisation by dumpark



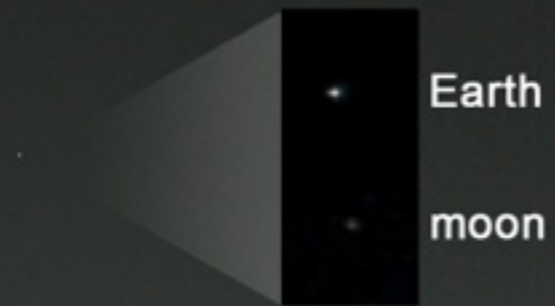
<http://app.dumpark.com/seas-of-plastic-2/>



Vantage Point







Earth

moon



Earth & Moon

Every human that has ever lived is *here*

you are here



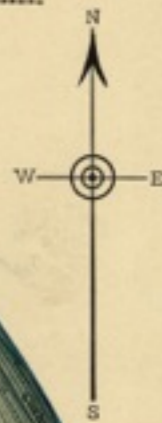
<http://www.distancetomars.com/>

Point of View

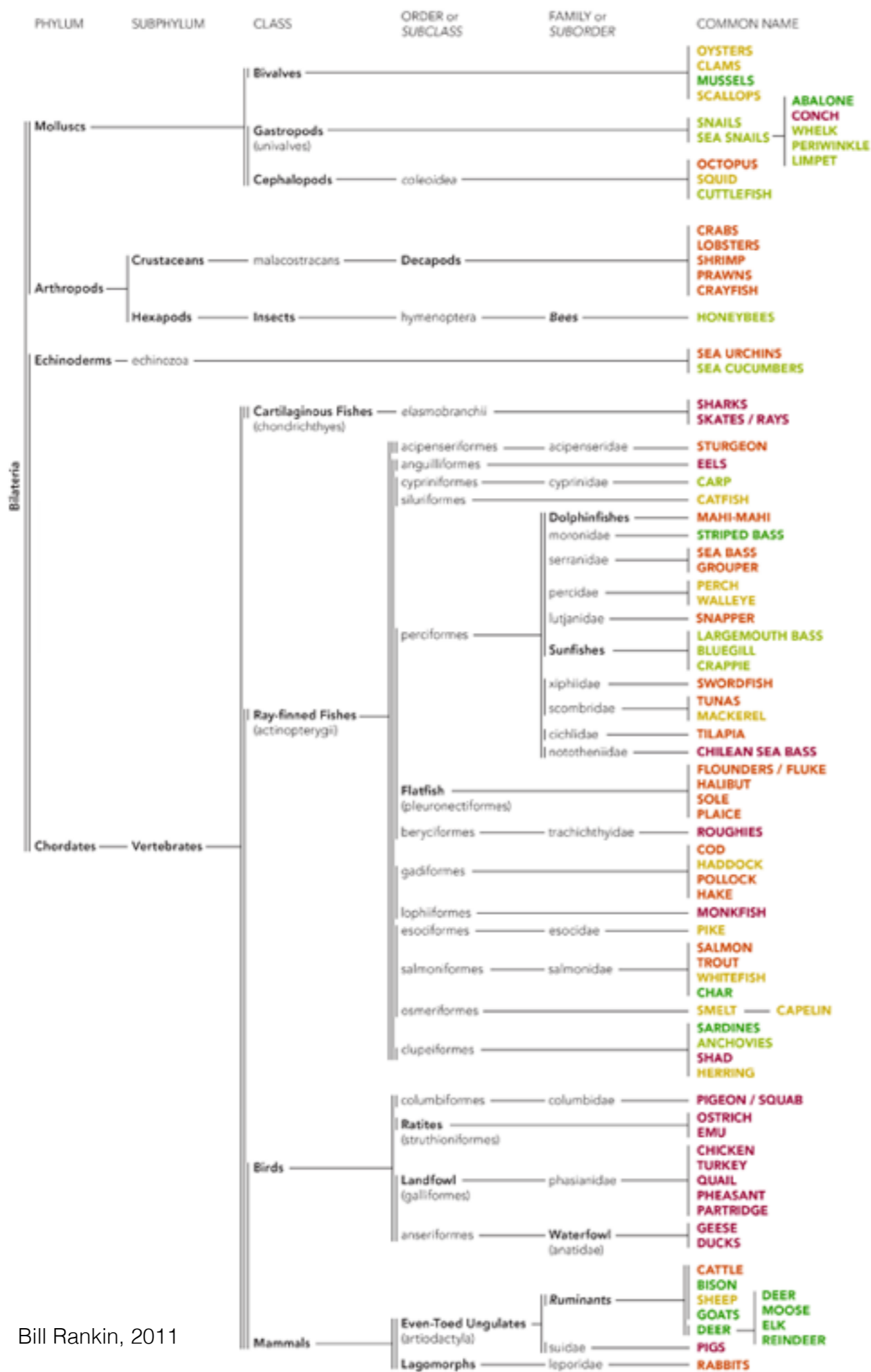
Map showing the
GREAT COAL FIELDS, NATURAL GAS FIELDS,
STEAM AND ELECTRIC RAILROADS
 and all important
CITIES, TOWNS, VILLAGES AND STREAMS
 tributary to
COLUMBUS
 within a radius of 70 Miles.

This Area Includes a
 Population of 1,398,000.

Steam Railroads are indicated thus: ————
 Electric Railroads ————



G
 4081
 C6H9
 1902
 M3



Ethically Eating Animals?

sustainable seafood ratings
from Monterey Bay Aquarium:
(not all rated fish included here)

ALWAYS OK

NEVER BAD

SOMETIMES BAD

ALWAYS BAD

other recommendations:

GENERALLY OK

poultry and livestock welfare:

NO CAGE FARMS

FEW CAGE FARMS

MANY CAGE FARMS

MOSTLY CAGE FARMS

(reptile and other exotic meat is
rarely farmed sustainably)

Area of circle proportional to State - 330° to the square inch.

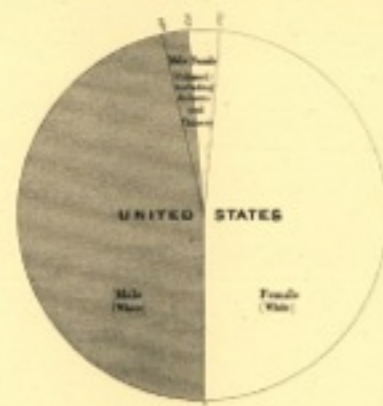
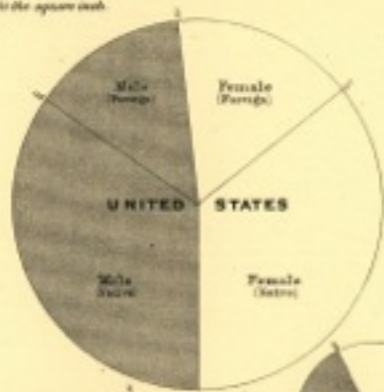


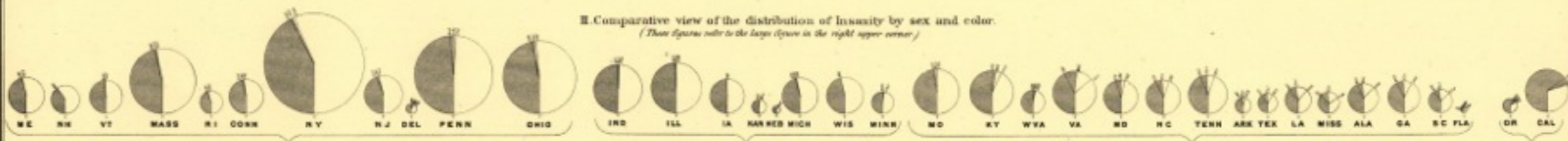
CHART
 SHOWING THE AGGREGATE NUMBER OF THE
INSANE
 AND THE PROPORTION OF MALES AND FEMALES,
 WHITE OR COLORED, NATIVE OR FOREIGN,
 AT THE SIXTH CENSUS 1870,
 also the increase since 1860.
 PREPARED FOR THE STATISTICAL ATLAS OF THE UNITED STATES
 by FRED H. WISES Secy Illinois State Board of Charities.

I. Comparative view of the distribution of insanity by sex and nativity in the several States.
 (These figures refer to the large figure in the left upper corner.)



I. If opposite first radius from here to left denotes degrees in sector for Native Males, that opposite second radius to left, the sum of the degrees in the two sectors for Males, Native and Foreign, that opposite first radius to right, degrees in sector for Native Females.

II. Comparative view of the distribution of insanity by sex and color.
 (These figures refer to the large figure in the right upper corner.)



II. If opposite first radius from here to left denotes degrees in sector for White Males, that opposite second radius to left, the sum of the degrees in the two sectors for Males, White and Colored, that opposite first radius to right, degrees in sector for White Females.

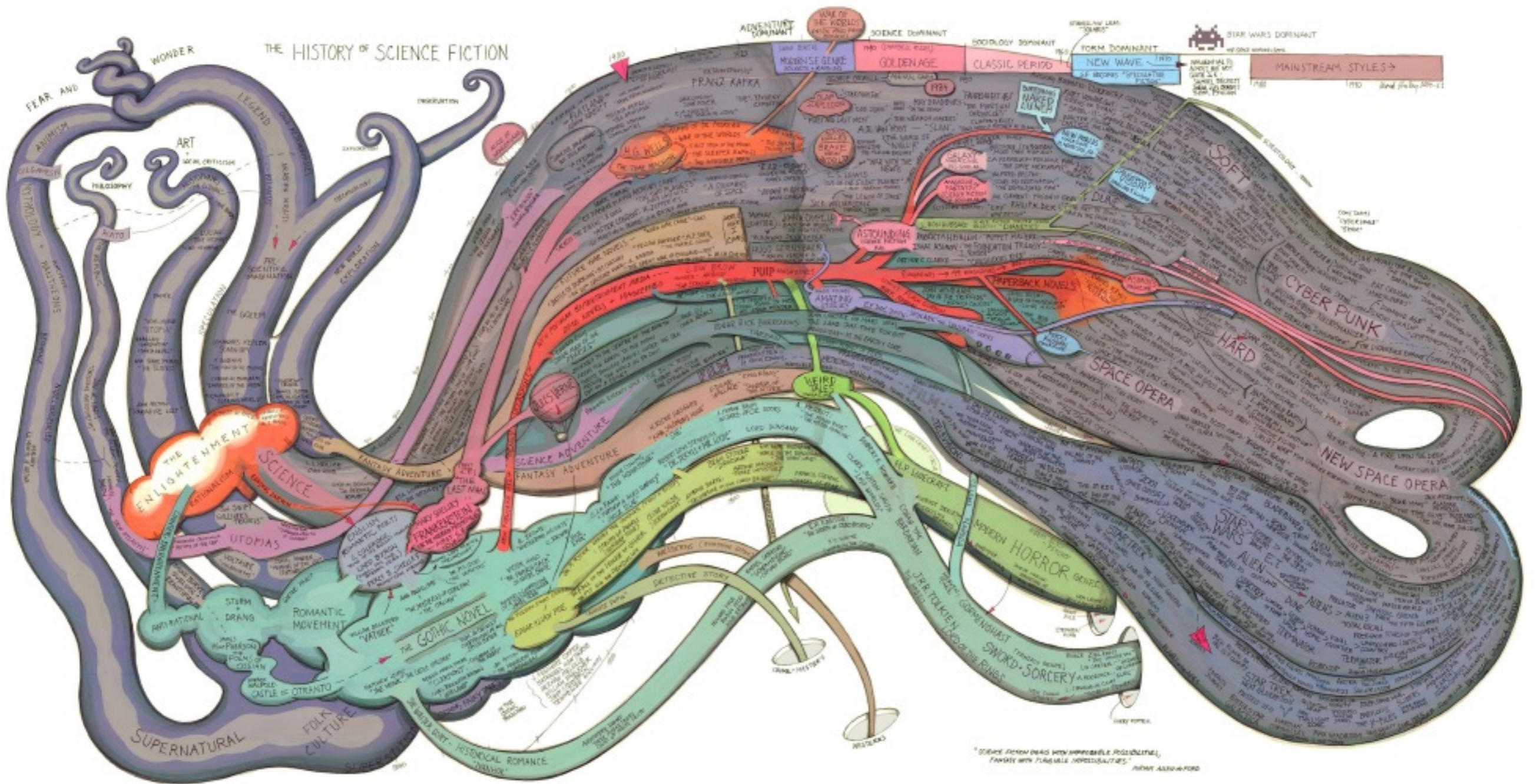
III. Comparative view of the increase in the number of insane between 1860 and 1870.



III. Inner circles represent numbers reported at 1860, outer circles, numbers at 1870, the shaded rings, the increase in the interval. In Mississippi the number reported at 1860 exceeds the number at 1870, in this case the inner circle represents 1870, and is shaded, the outer circle represents 1860, and the ring is left unshaded.

Make it Human

THE HISTORY OF SCIENCE FICTION



"SCIENCE FICTION BEGINS WITH IMPOSSIBLE POSSIBILITIES, FAMILIAR WITH FLEETING IMPOSSIBILITIES"
 JERRY ALLEN-FORD