Maps!

Todd Theriault & Katy Börner, CNS, ILS, SoIC, IU, Bloomington, IN
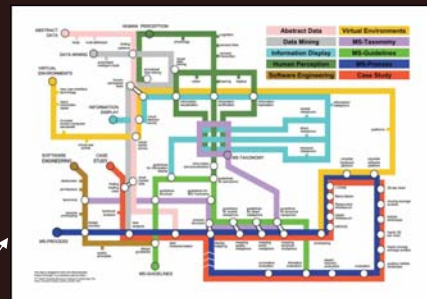http://scimaps.org | http://cns.iu.edu

Blooomington Science Café

December 3, 2013
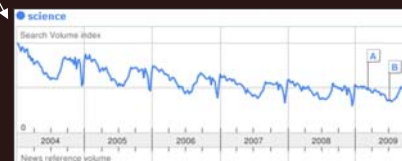

Terra bytes of data

Descriptive & Predictive Models

Find your way

Find collaborators, friends

Identify trends

2

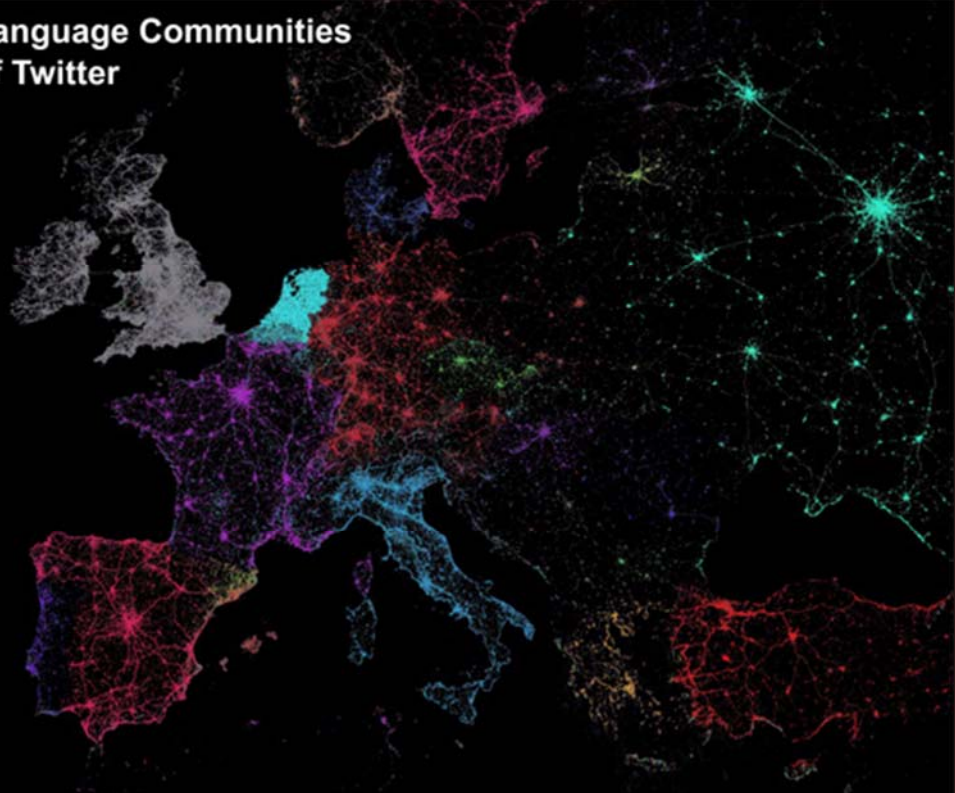**Places & Spaces: Mapping Science**
scimaps.org

Places & Spaces: Mapping Science
scimaps.org

Iteration 1:
The Power
of Maps
(2005)

Iteration 2:
The Power of
Reference
Systems
(2006)

Iteration 3:
The Power of
Forecasts
(2007)

Iteration 4:
Science Maps
for Economic
Decision
Makers
(2008)

Iteration 5:
Science Maps
for Science
Policy Makers
(2009)

Iteration 6:
Science Maps
for Scholars
(2010)

Iteration 7:
Science Maps
as Visual
Interfaces to
Digital
Libraries
(2011)

Iteration 8:
Science Maps
for Kids
(2012)

Eric Fischer. 2012. Language Communities of Twitter.
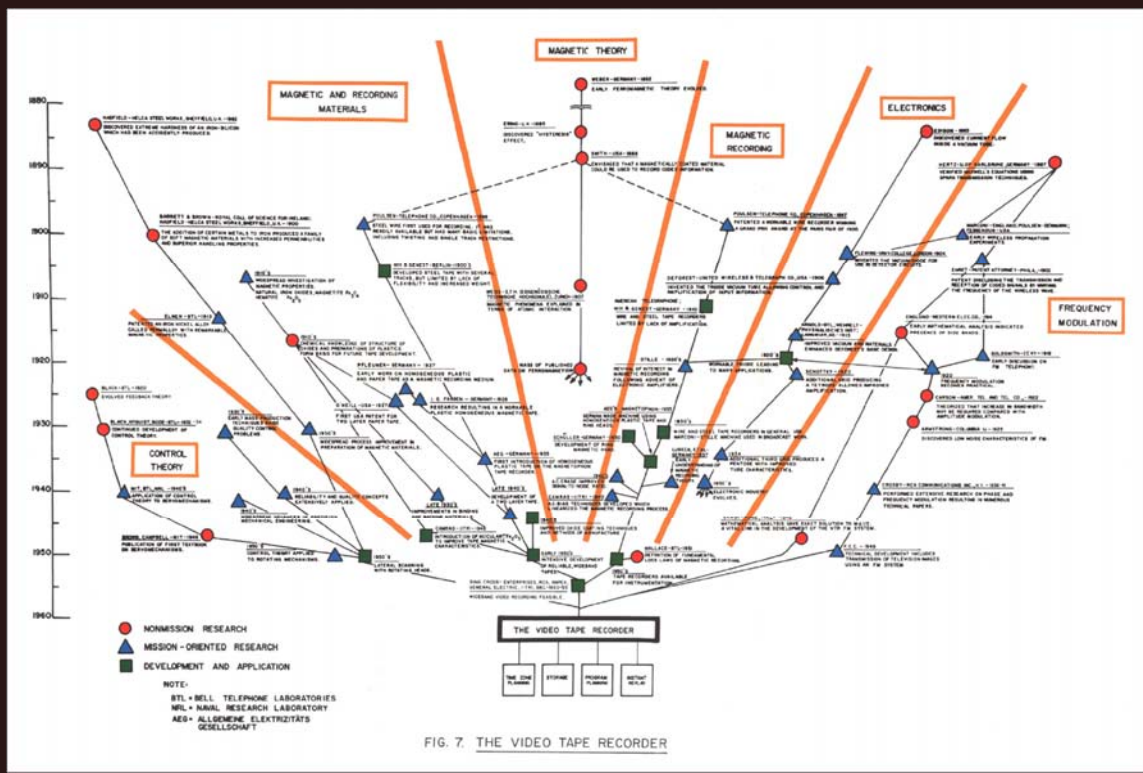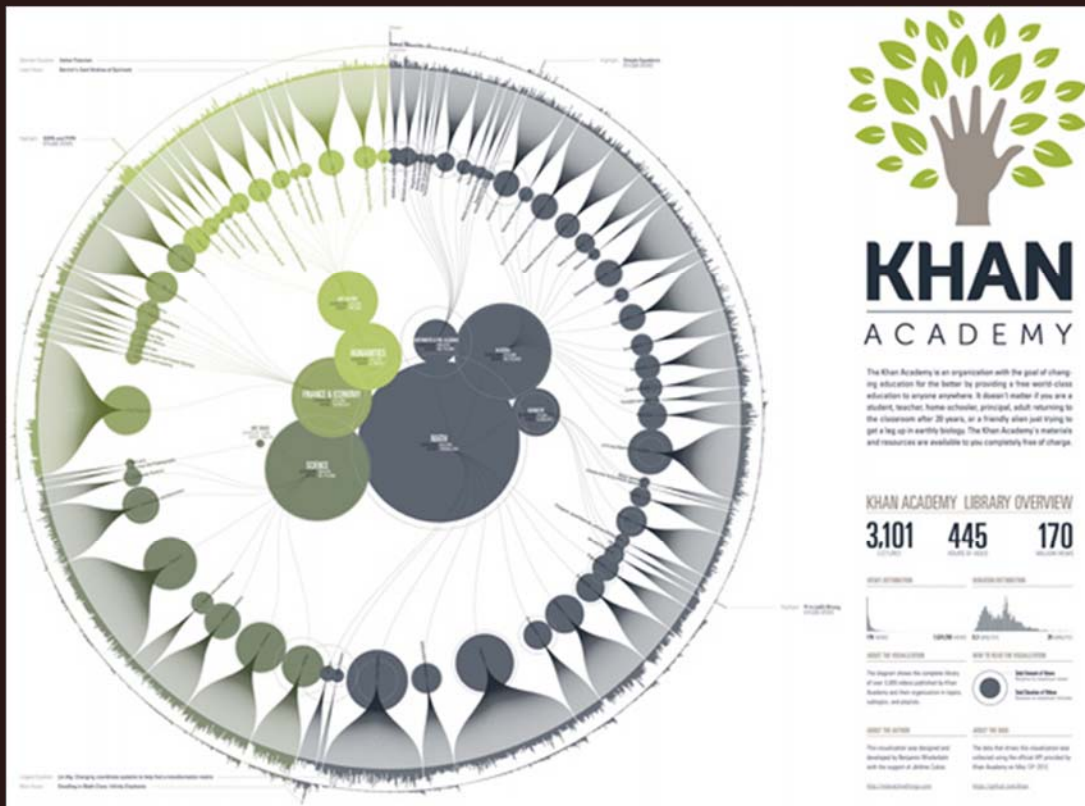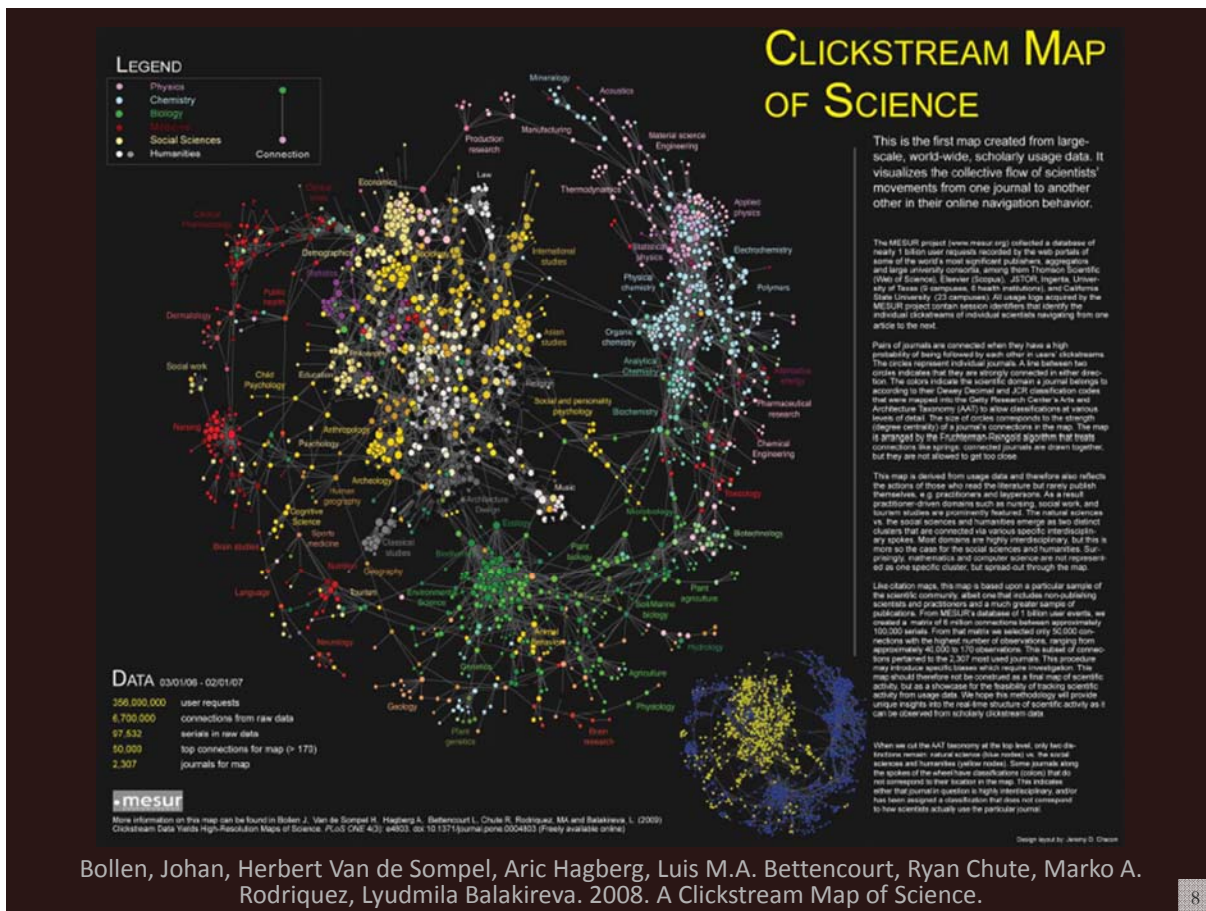
G. Benn and Francis Narin. 1968. Tracing of Key Events in the Development of the Video Tape Recorder

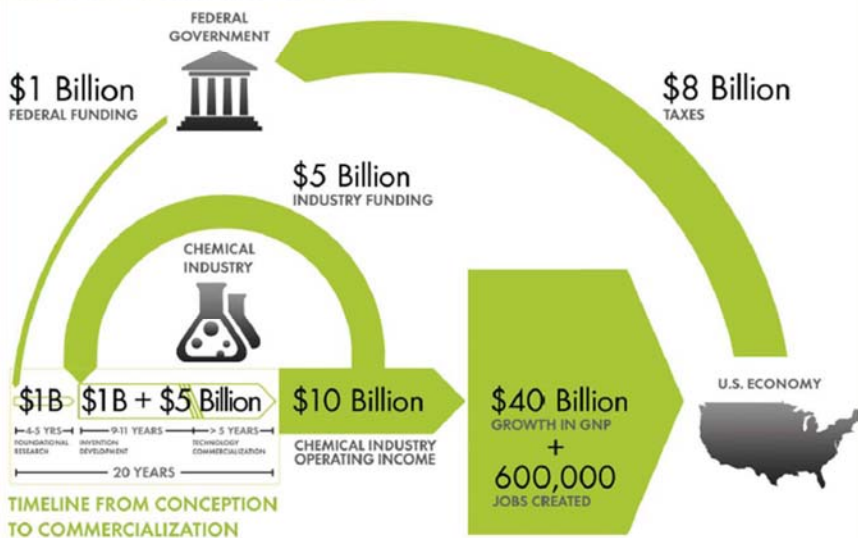Benjamin Wiederkehr and Jérôme Cukier. 2012. Khan Academy Library Overview.

Bollen, Johan, Herbert Van de Sompel, Aric Hagberg, Luis M.A. Bettencourt, Ryan Chute, Marko A. Rodriquez, Lyudmila Balakireva. 2008. A Clickstream Map of Science.

Council for Chemical Research. 2009. Chemical R&D Powers the U.S. Innovation Engine.
Washington, DC. Courtesy of the Council for Chemical Research.

9

Illuminated Diagram Display on
display at the Smithsonian in DC.
http://scimaps.org/exhibit_info/
#ID

10

Slide 11

Geographic Map: Where Science Gets Done

North & West Asia
Europe
North America
Central America
Africa
South & East Asia
Oceania
South America
Oceania
Australia
Antarctica

Science Map: How Scientific Disciplines Relate

Math & Physics
Chemistry
Health Professionals
Electrical Engineering & Computer Science
Aeronautical, Chemical, Mechanical & Civil Engineering
Medical Specialties
Social Sciences
Biotechnology
Brain Research
Infectious Diseases
Earth Sciences
Biology
Humanities

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About

This Illuminated Diagram display adds the flexibility of an interactive program to the incredibly high data density of a print. This technique is generally useful when there is too much pertinent data to be displayed on a screen but the data is relatively stable. The computer can direct the eye to what's important by using projectors or screens as smart spotlights, animating the research impact of individuals, giving a "grand tour" of science, or highlighting query results (as when you touch the lectern or use the keyboard) with an overlay of moving light.

PLACES & SPACES
http://scimaps.org

Top Five Continents

North America - 4,000 records
South & East Asia - 3,589
Australia - 2,431
Africa - 2,208
South America - 1,562

Top Five Scientific Disciplines

Math & Physics - 4,000 records
Health Professionals - 3,589
Social Sciences - 2,431
Aeronautical, Chemical, Mechanical & Civil Engineering - 2,208
Humanities - 1,562

Input your search query here.

Q W E R T Y U I O P
A S D F G H J K L "
Z X C V B N M ⌫
Space   Go

Search

The keyboard supports retrieval and display of papers based on their Medical Subject Headings (MeSH) and MeSH qualifier terms. If multiple terms are entered in a field, they are automatically combined using "OR". So, "breast cancer" matches any record with "breast" or "cancer" in that field. You can put AND between terms to combine with "AND". Thus "breast AND cancer" would only match records that contain both terms. Double quotation can be used to match compound terms, e.g., "breast cancer" retrieves records with the phrase "breast cancer", and not records where "breast" and "cancer" are both present, but the exact phrase.

People & Topics

11

Slide 12

Geographic Map: Where Science Gets Done

North & West Asia
Europe
North America
Central America
Africa
South & East Asia
Oceania
South America
Oceania
Australia
Antarctica

Science Map: How Scientific Disciplines Relate

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Biotechnology
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Earth Sciences
Biology
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About

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PLACES & SPACES
http://scimaps.org

Elinor Ostrom - Nobel Prize in Economic Sciences 2009

Born: 7 August 1933, New York, NY, USA

Affiliation at the time of the award: Indiana University, Bloomington, IN, USA, Arizona State University, Tempe, AZ, USA

Prize motivation: "for her analysis of economic governance, especially the commons"

Field: Economic governance

Contribution: Challenged the conventional wisdom by demonstrating how local property can be successfully managed by local commons without any regulation by central authorities or privatization.

Cancer | Cloning | HIV | Robert G. Edwards | Roger D. Kornberg | Elinor Ostrom
Obesity | Quality of Life | Smoking | Stanley B. Prusiner | Ahmed H. Zewail | View All

Interact

Select any location on the *Geographic Map* location (by brushing your finger over an area on the lectern's touch screen) and topics studied in that area will highlight on the *Science Map*: the brighter a topic glows, the more papers on that topic originated in the selected area. Conversely, touching a scientific area in the *Science Map* illuminates places on the *Geographic Map* where that topic is studied. People and topic buttons support the exploration of publication output by selected Noble laureates and particular lines of research using MEDLINE data from 2000-2009.

Keyword Search

12

Ingo Gunther's Worldprocessor globe design on display at the Giant Geo Cosmos OLED Display at the Museum of Emerging Science and Innovation in Tokyo, Japan

13

Science Maps in "Expedition Zukunft" science train visiting 62 cities in 7 months 12 coaches, 300 m long Opening was on April 23rd, 2009 by German Chancellor Merkel
http://www.expedition-zukunft.de

14

Debut of 5th Iteration of Mapping Science Exhibit at MEDIA X was on May 18, 2009 at Wallenberg Hall, Stanford University, *http://mediax.stanford.edu*, *http://scaleindependentthought.typepad.com/photos/scimaps*

15

scimaps.org/contact

16

Science Maps for Kids 2012

VIII.1

VIII.3

VIII.5

VIII.7

VIII.9

VIII.2

VIII.4

VIII.6

VIII.8

VIII.10
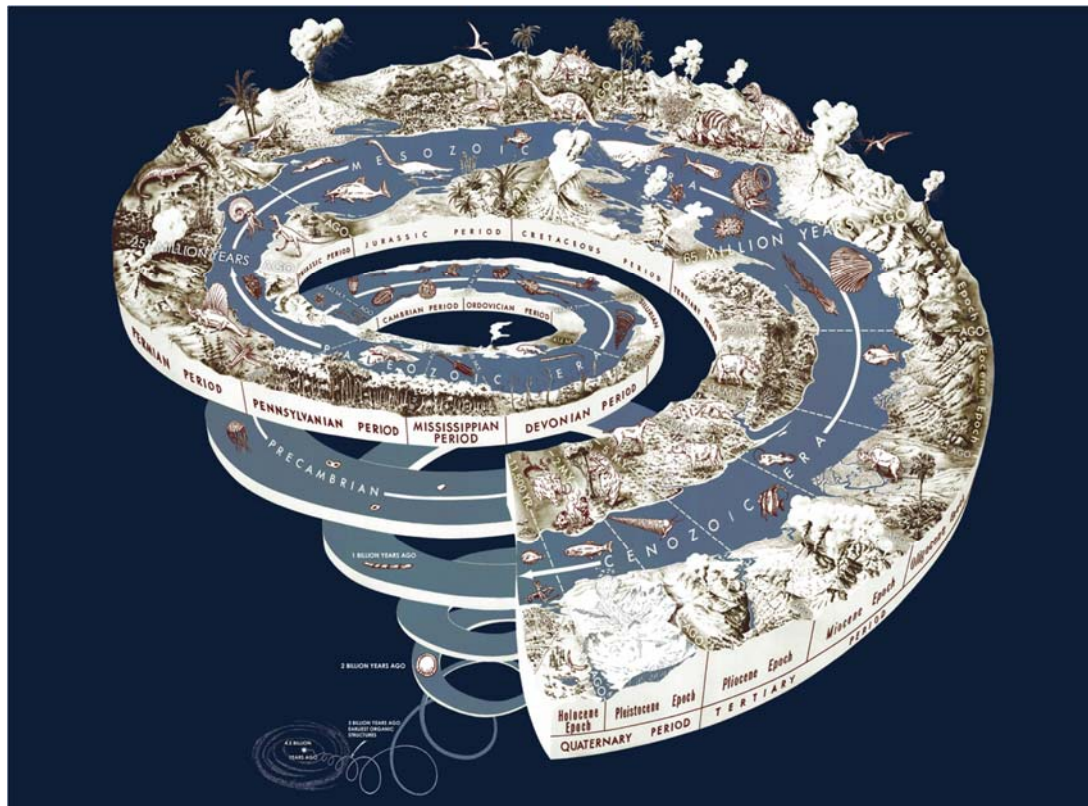
Geologic Time Spiral: A Path to the Past - Joseph Graham, William Newman, and John Stacy - 2008
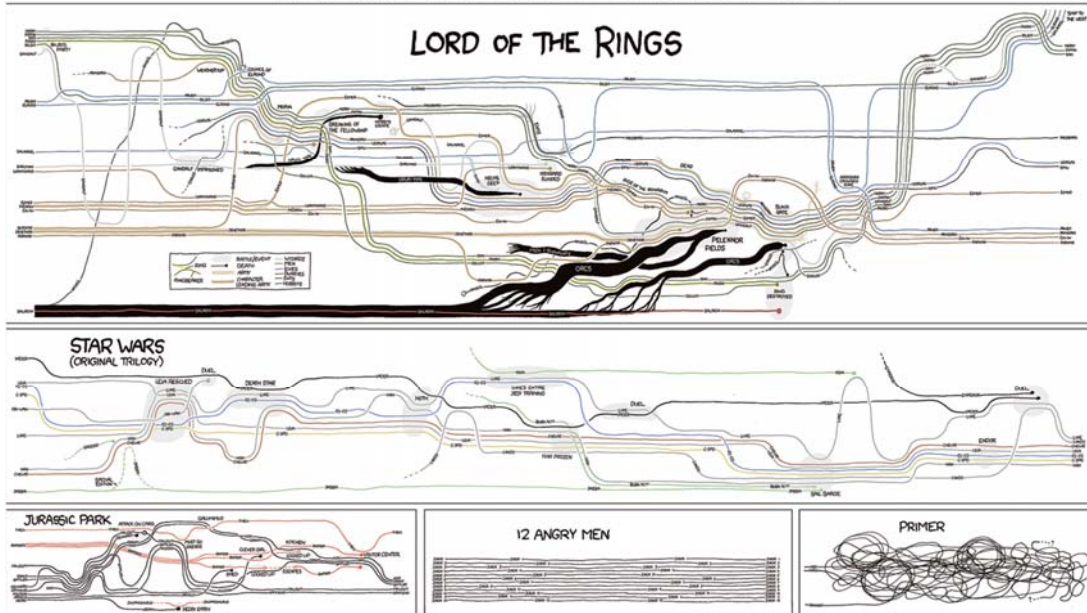
Movie Narrative Charts (Comic #657) - Randall Munroe - 2009
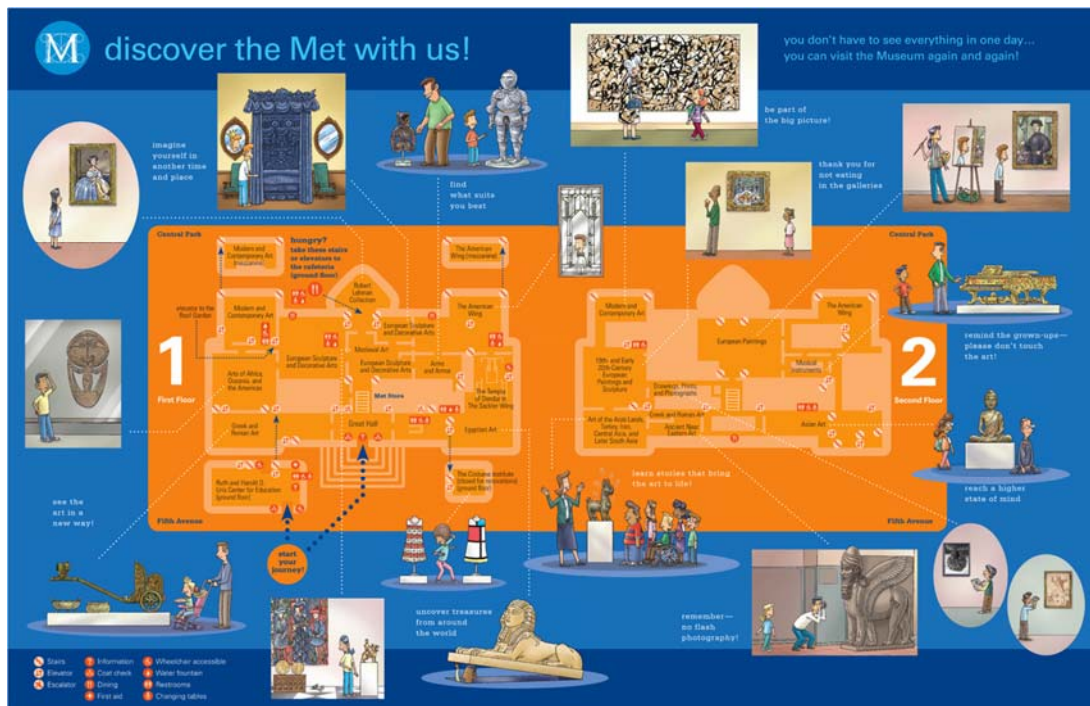
Metropolitan Museum of Art Family Map - Masha Turchinsky and John Kerschbaum - 2008
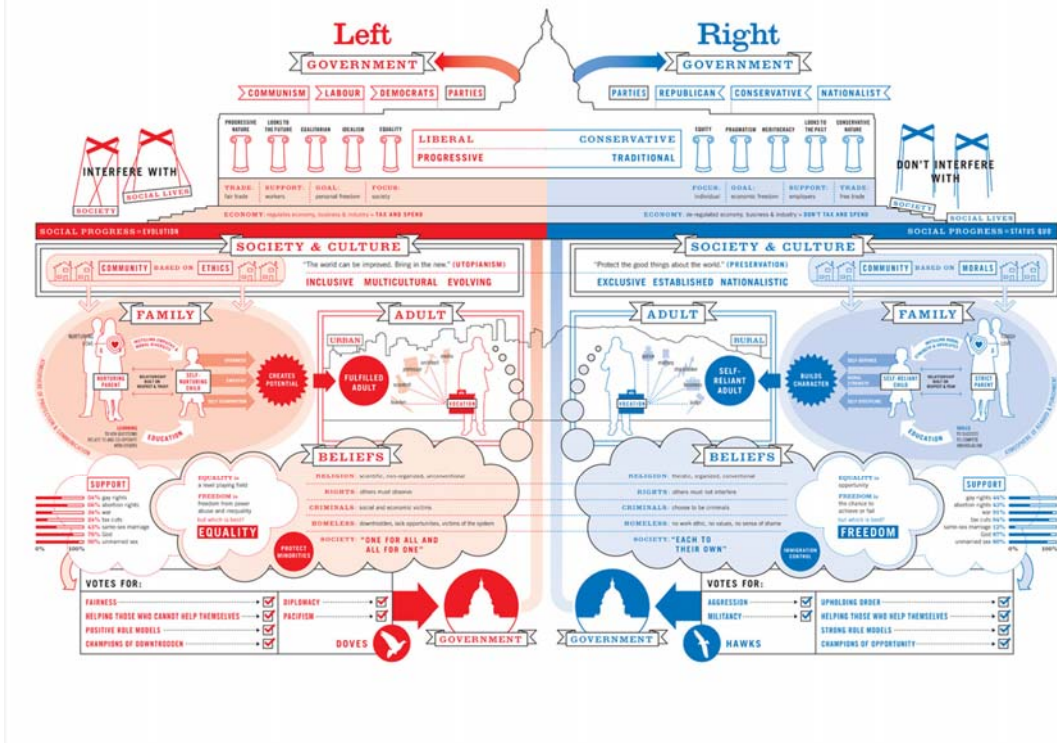
Left vs. Right Political Spectrum - David McCandless and Stefanie Posavec - 2009
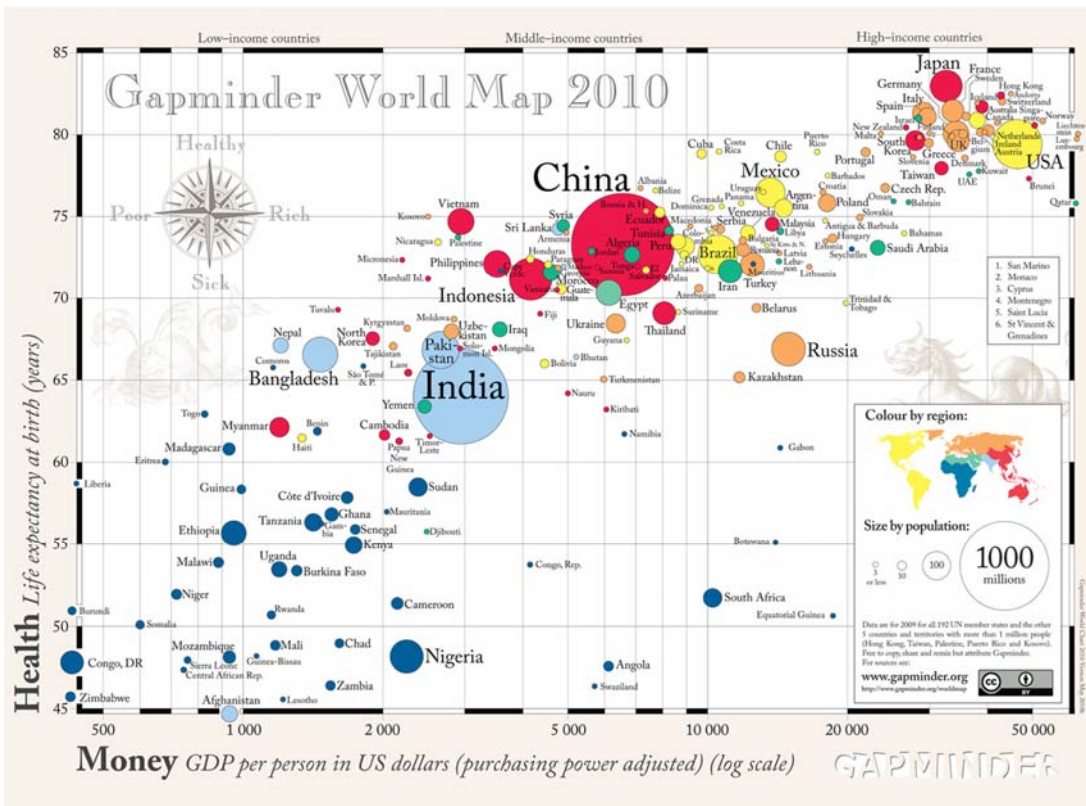
Gapminder World Map - Mattias Lindgren - 2010

Knowledge Web - James Burke, Patrick McKercher, and Michael J. Stamper - 2012

Manga Universe - Lev Manovich and Jay Chow - 2012

The Fundamental Interconnectedness of All Things - Matthew Richardson, Judith Kamalski, Sarah Huggett, and Andrew Plume - 2012
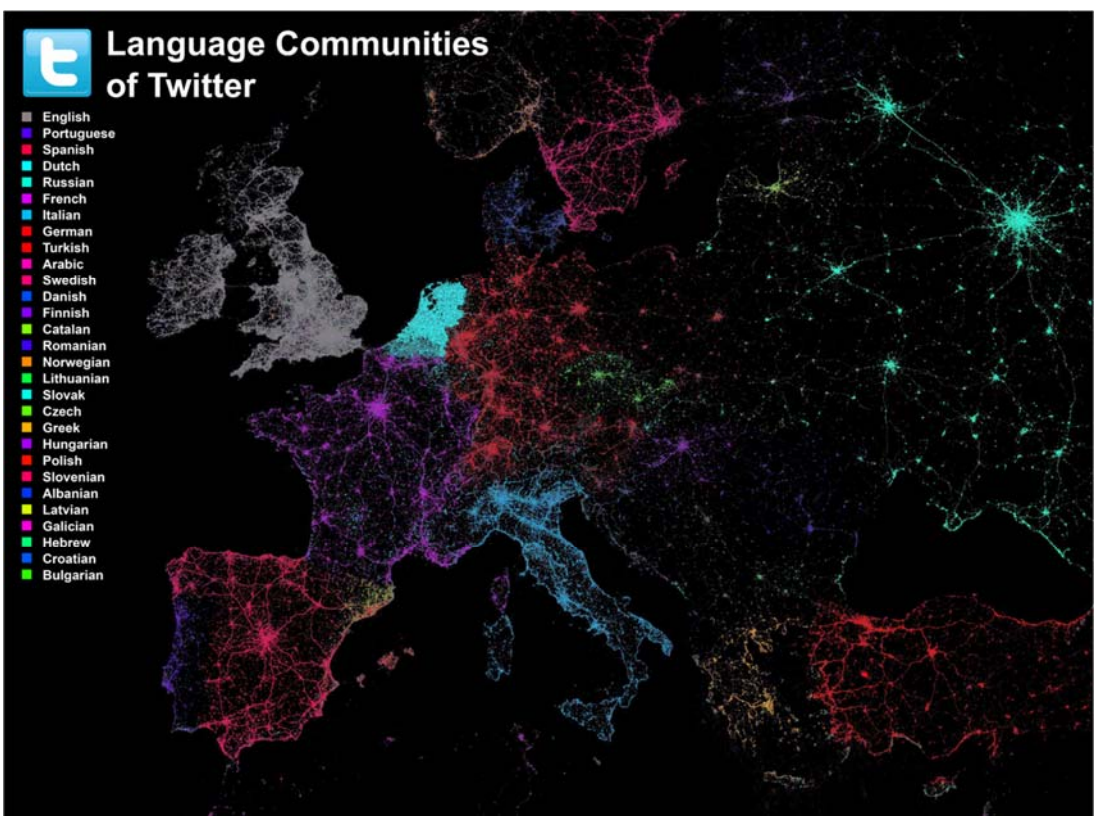
Language Communities of Twitter - Eric Fischer - 2012
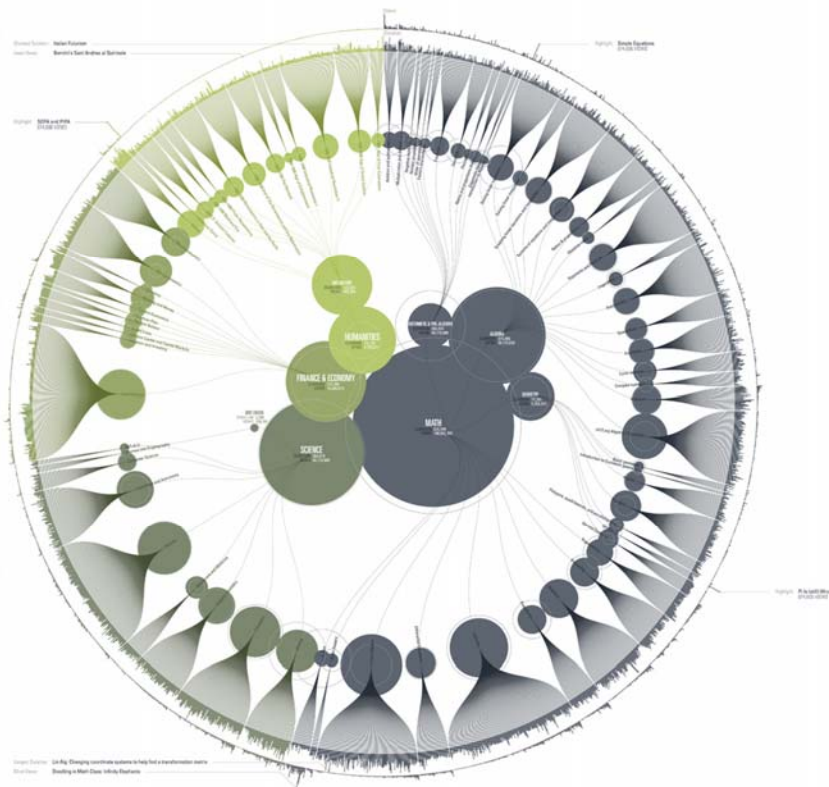
Khan Academy Library Overview - Benjamin Wiederkehr and Jérôme Cukier - 2012

Science Maps Showing Trends and Dynamics 2013

NASA Views Our Perpetually Moving Ocean - Dimitris Menemenlis, Horace G. Mitchell, Christopher N. Hill, and Gregory W. Shirah - 2011
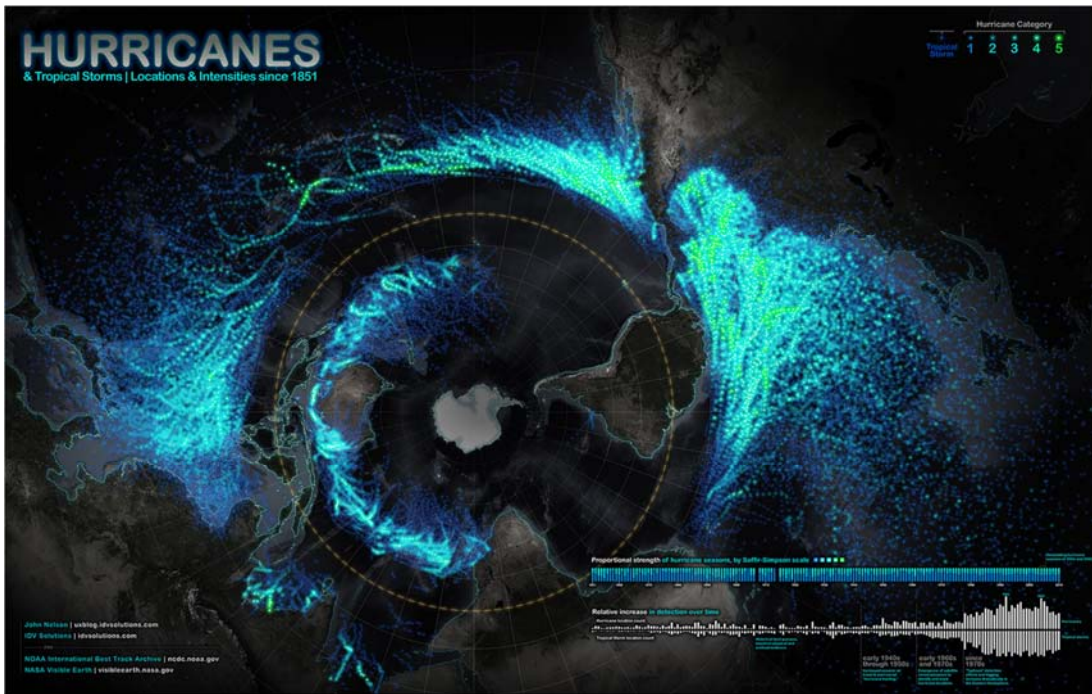
Hurricanes & Tropical Storms—Locations and Intensities Since 1851 - John Nelson - 2012
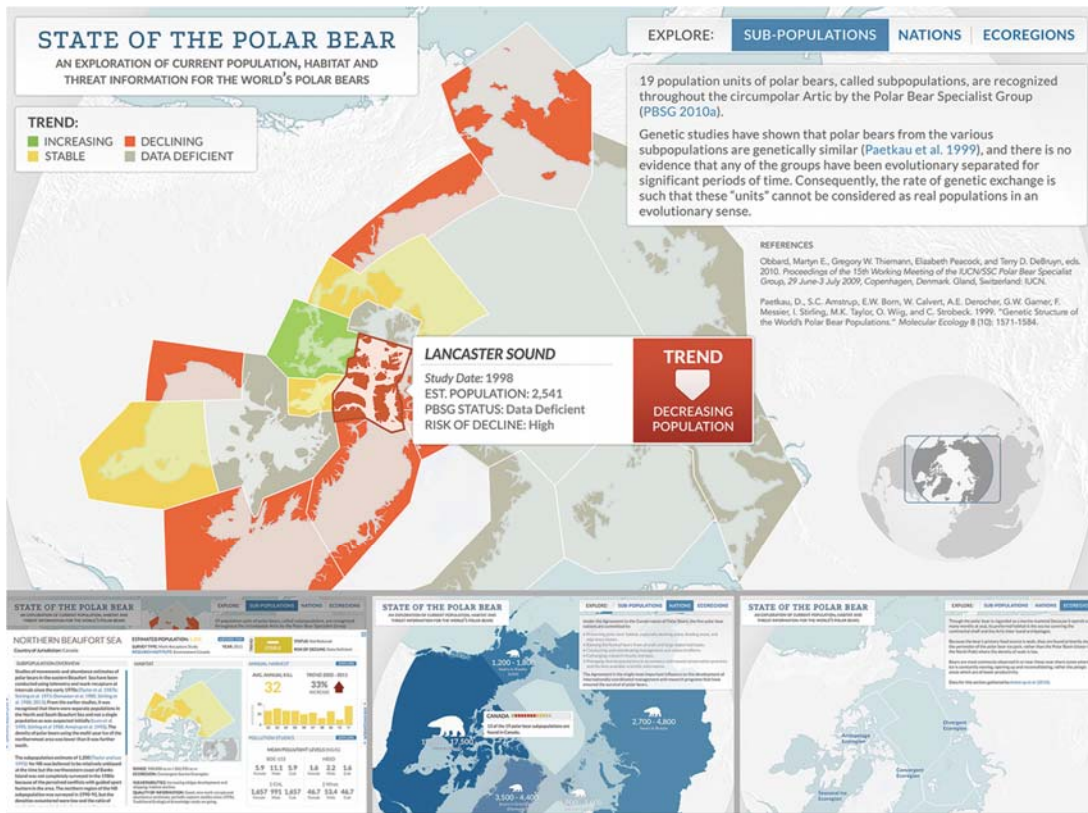
State of the Polar Bear - Dino Citraro, Kim Rees, Jacob O'Brien, Brett Johnson, Domanique Alicia, and Andrew Winterman - 2013
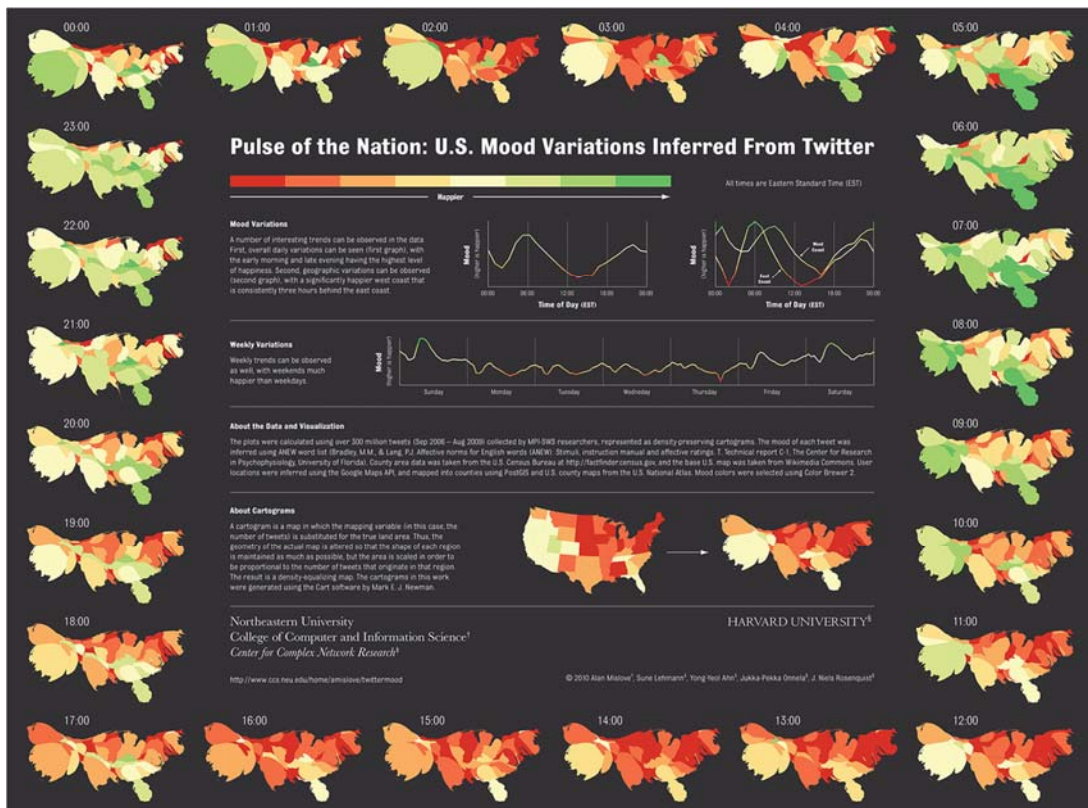
Pulse of the Nation - Alan Mislove, Sune Lehmann, Yong-Yeol Ahn, Jukka-Pekka Onnela, and James Niels Rosenquist - 2010
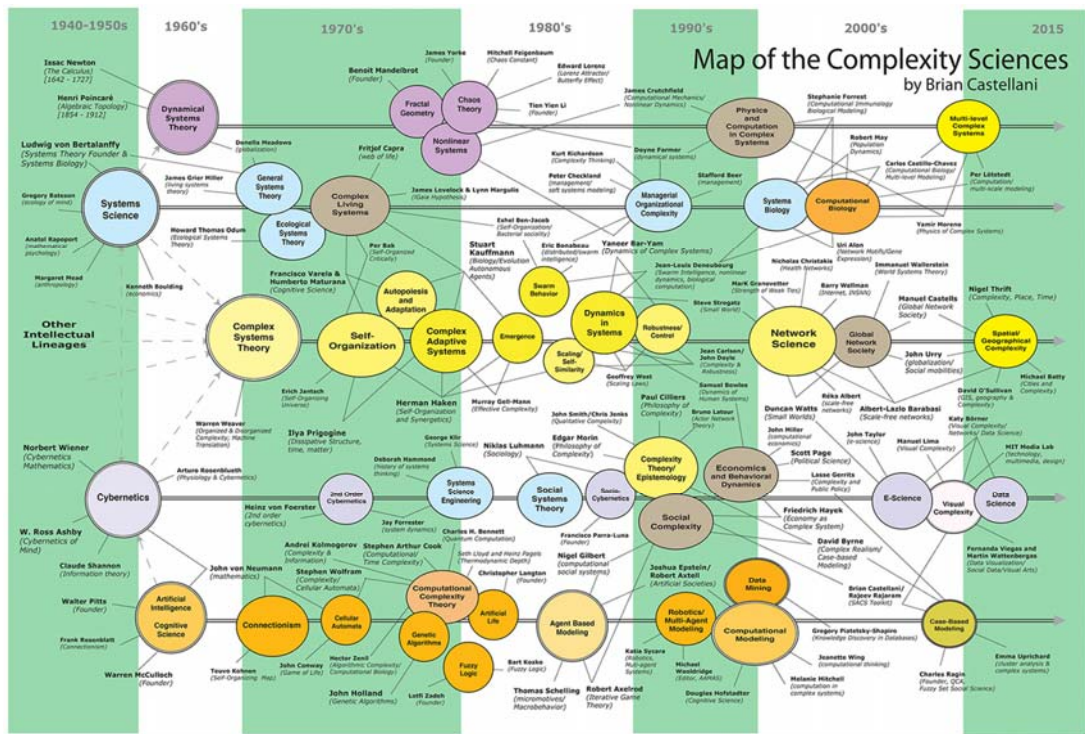
Map of Complexity Science - Brian Castellani - 2013

IX.6 Visualizing Trends and Dynamics: 30 Years of Scientific Development - Nees Jan van Eck, Ludo Waltman, and Ferdy van Gool - 2013

The Hewlett Foundation Grant Visualizer - Dino Citraro, Kim Rees, Jacob O'Brien, Brett Johnson, Andrew Winterman, and Andrew Witherspoon - 2013

Who Really Matters in the World—Leadership Networks in Different-Language Wikipedias - Peter A. Gloor, Keiichi Nemoto, Samuel T. Mills, and David E. Polley - 2013

Identifying Emerging Topics in Science and Technology - Kevin W. Boyack, Richard Klavans, and Henry G. Small - 2013
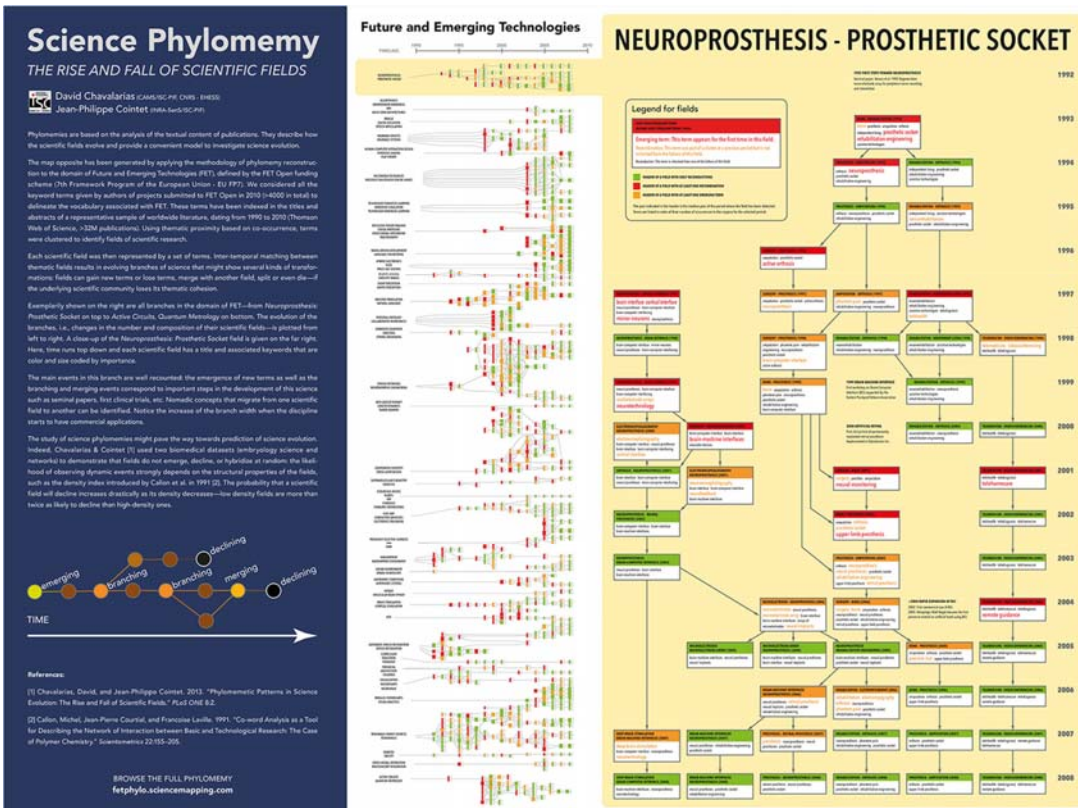
Science Phylomemy - David Chavalarias and Jean-Philippe Cointet - 2013

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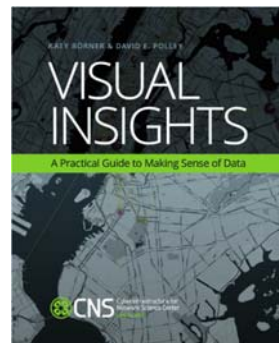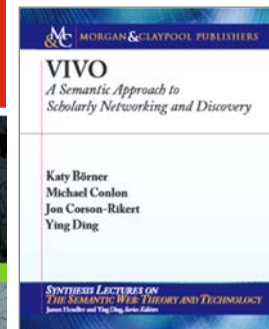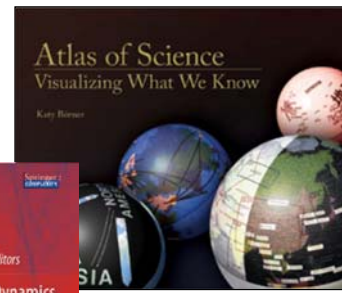
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Register for free at http://ivmooc.cns.iu.edu. Class restarts on Jan 28, 2014.

All papers, maps, tools, talks, press are linked from http://cns.iu.edu
These slides are at http://cns.iu.edu/docs/presentations/2013-borner-scielo.pdf

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Mapping Science Exhibit Facebook: http://www.facebook.com/mappingscience

41