Maps that Matter

RGS-IBG Annual International Conference

Maps that Matter: Visualising Geographic Theory

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University of Manchester

http://mapsthatmatter.blogspot.com

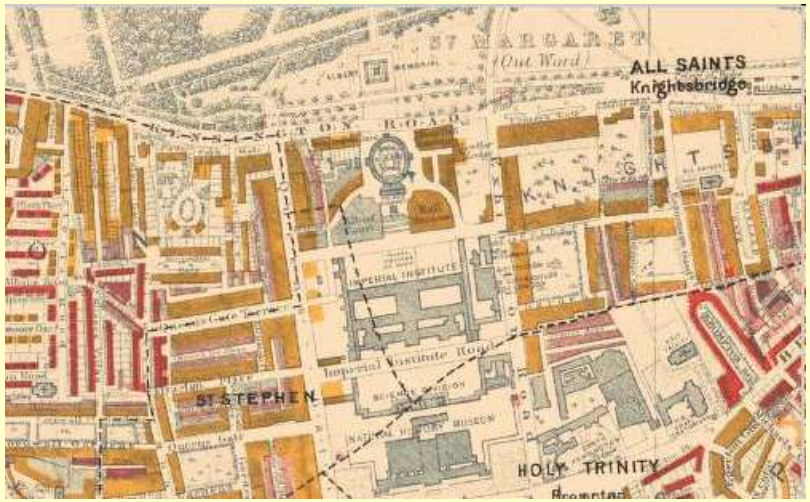
Which maps matter?

- Our selection criteria
  - **Maps and diagrams** not photos or film
  - **Impact on Geographic** theory or practice
  - 'Citability' + longevity: **‘Classics’**
  - **Iconicity** – design clarity

Maps that Matter

Charles Booth: Maps Descriptive of London Poverty 1886-1903

- Original publication associated with Booths's *Inquiry into the Life and Labour of the People in London.*
- Strongly influential on the study of geographies of inequality.
- Key start point for much thematic mapping, census cartography and descriptive analysis of social geography; e.g. CASA's *London Profiler.*



(Source: http://booth.lse.ac.uk)

Maps that Matter

Booth-influenced London Profiler 2008

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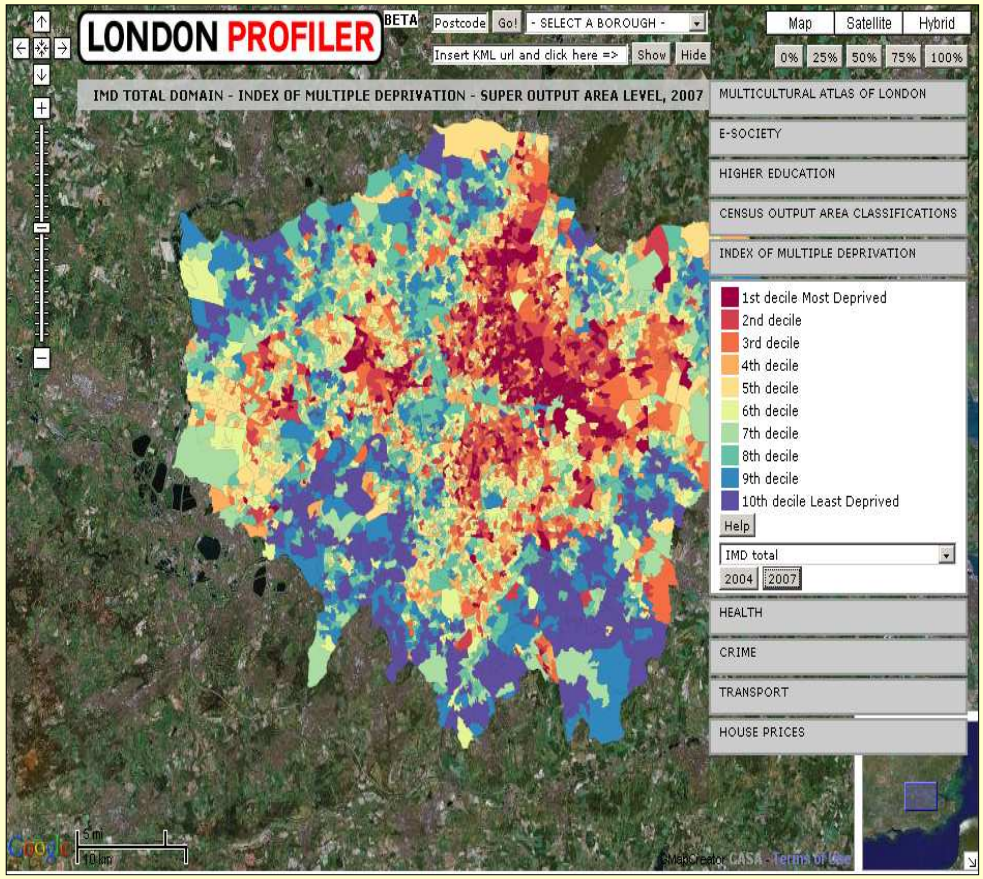
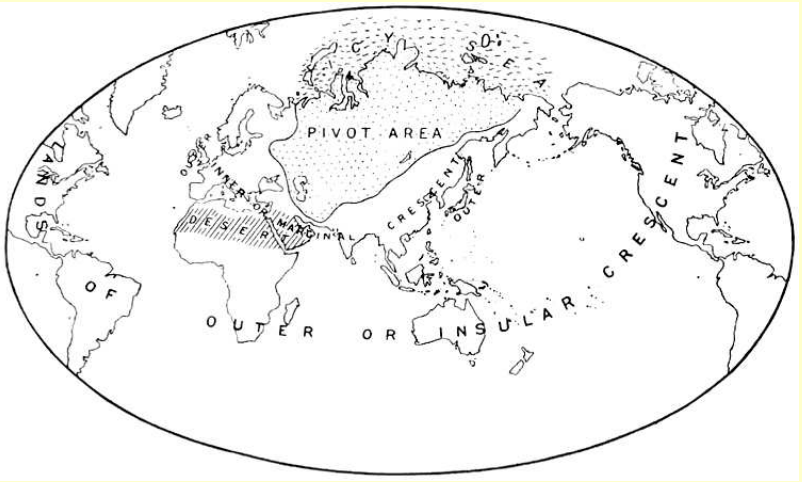


(Source: http://www.londonprofiler.org)

Maps that Matter

Sir Halford Mackinder: Heartlands theory map 1904

- First published in the 1904 article, *The Geographical Pivot of History*.
- Foundational idea in geopolitics: "Who rules East Europe commands the Heartland; Who rules the heartland commands the World Island; Who rules the World Island commands the World."
- Geopolitical mapping linking politics to territorial control published ever since.
- Contemporary resonance; e.g. Barnett's *Pentagon's New Map*.



(Source: http://www.jstor.org/stable/pdfplus/1775498.pdf)

Maps that Matter

Mackinder-inspired Mapping America's 'war on terror'

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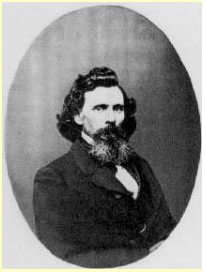
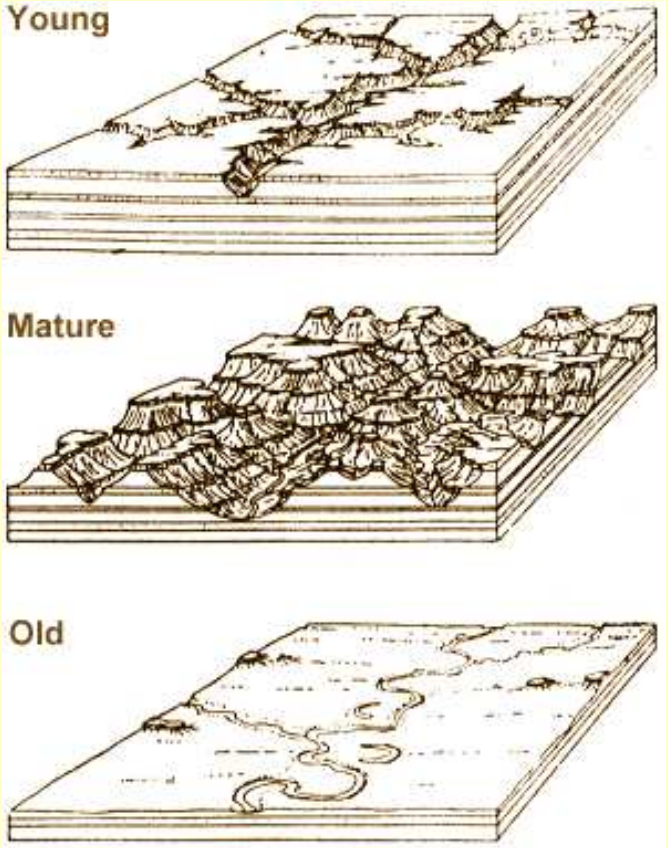
(Source: http://www.thomaspmbarnett.com)

Maps that Matter

William Morris Davis: Cyclical model of fluvial erosion 1909



- Idea of progressive slope reduction developed from 1889, first formalized in Davis W.M. (1909) *Geographical Essays.*
- Popularised by Davis' students and first visually represented as block diagrams in 1930s.
- Hegemonic influence on practice of Physical Geography until the rise of process studies in the 1960s and 70s.

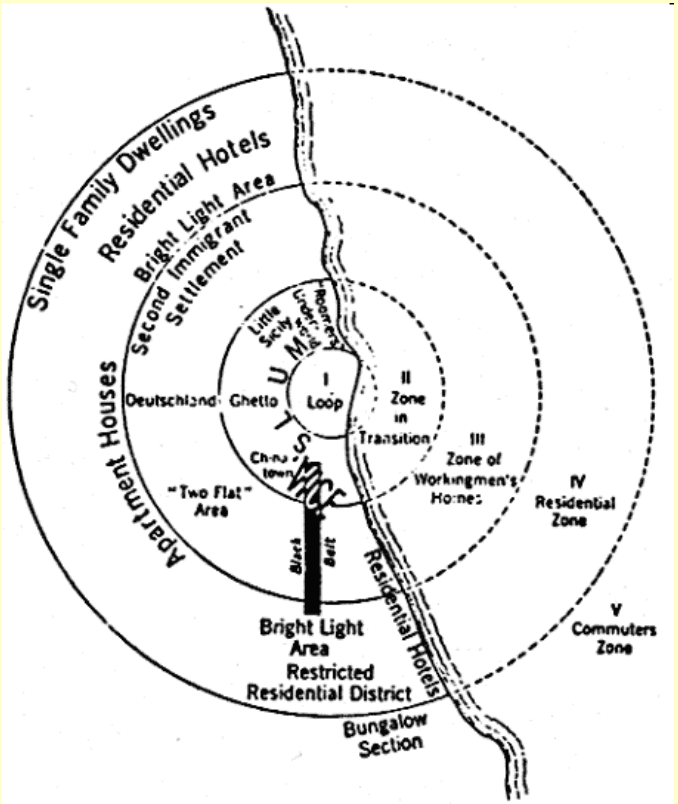


(Source: http://www.geocities.com/geomwl)

Maps that Matter

Ernest W. Burgess: Burgess concentric ring model 1925

- First published in 1925 in Burgess' chapter in Park et al. *The City*.
- First and strongly iconic neo-classical spatial model of urban structure to explain distribution of social classes in the city invoking bid rent curves.
- Came to represent views of the Chicago School and strongly influenced other modellers such as Hoyt, Harris and Ulmann and subsequent quantifiers in Urban Social Geography.



(Source: Park R., Burgess E.W. and McKenzie R.D. (1925) *The City,* Chicago: University of Chicago Press)

Maps that Matter

Burgess-inspired Sectoral and multiple nuclei models

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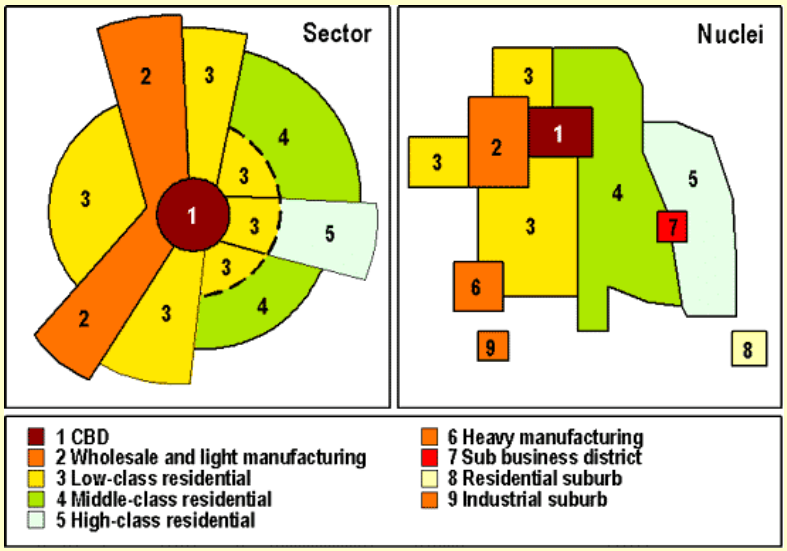
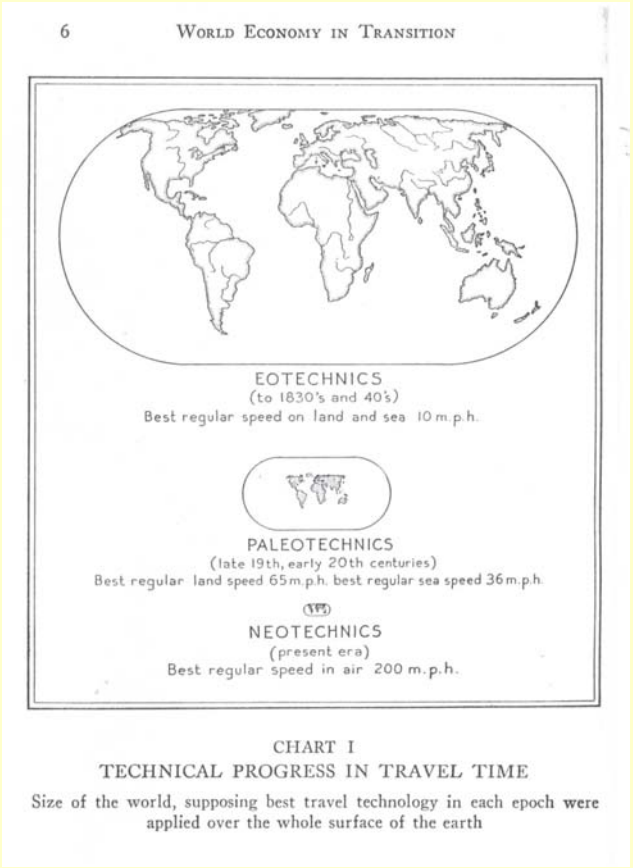


(Source: http://teacherweb.ftl.pinecrest.edu/snyderd/APHG/Unit%206/urbannotes.htm)

Maps that Matter

Eugene Staley: Shrinking world 1939

- Illustration in Staley's 1939 monograph *World Economy in Transition*.
- Perhaps the first visual representation of the impact of technical progress on global travel time.
- Shrinking world concept popularised in the literature of globalization, for example in books such as Peter Dicken's *Global Shift* and as an illustration of time-space compression by David Harvey in *The Condition of Postmodernity.*



(Source: http://www.sunysb.edu/libmap/coordinates/seriesa/no3/a3.htm)

Maps that Matter

Staley-inspired globalization diagrams

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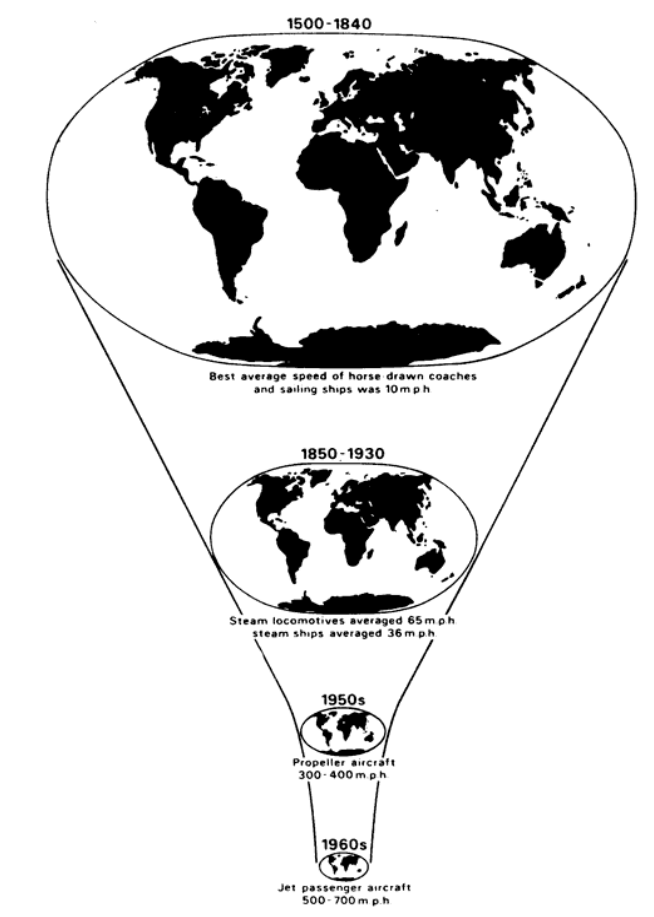

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Maps that Matter

Harry Godwin: Pollen analysis diagrams 1934

- Technique for quantitative analysis of changes in vegetation developed by van Post in Sweden in early 1900s.
- Popularized in Britain following Godwin's 1934 publications of two part article, *Pollen Analysis: An Outline of the Problems and Potentialities of the Method*.
- Diagrammatic expression of technique exploited by Godwin and other researchers in East Anglia, led to the successful explanation for environmental changes in the Holocene and pioneering of other rigorous dating methodologies.

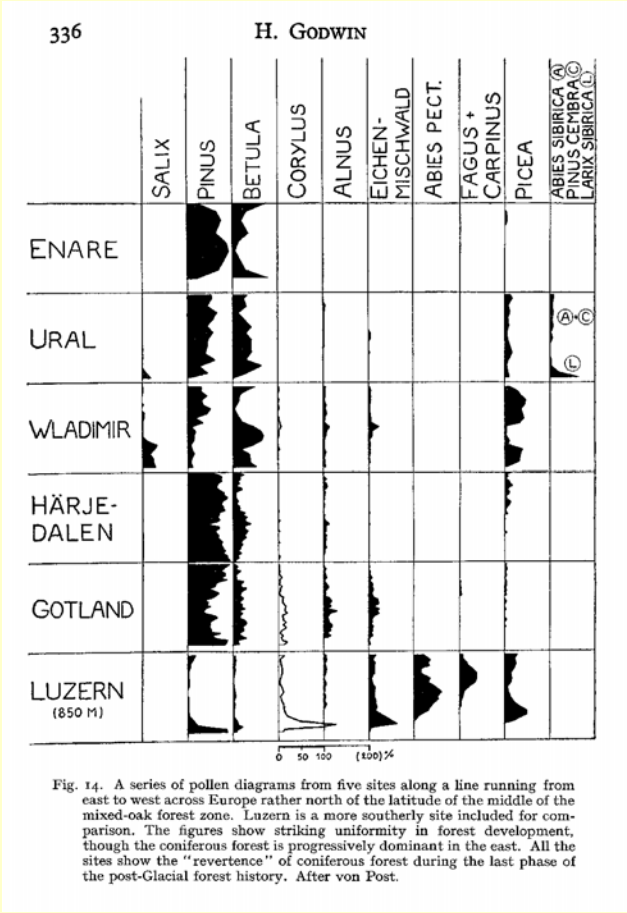

Fig. 14. A series of pollen diagrams from five sites along a line running from east to west across Europe rather north of the latitude of the middle of the mixed-oak forest zone. Luzern is a more southerly site included for comparison. The figures show striking uniformity in forest development, though the coniferous forest is progressively dominant in the east. All the sites show the "revertence" of coniferous forest during the last phase of the post-Glacial forest history. After von Post.

(Source: http://www.jstor.org/stable/2428587)

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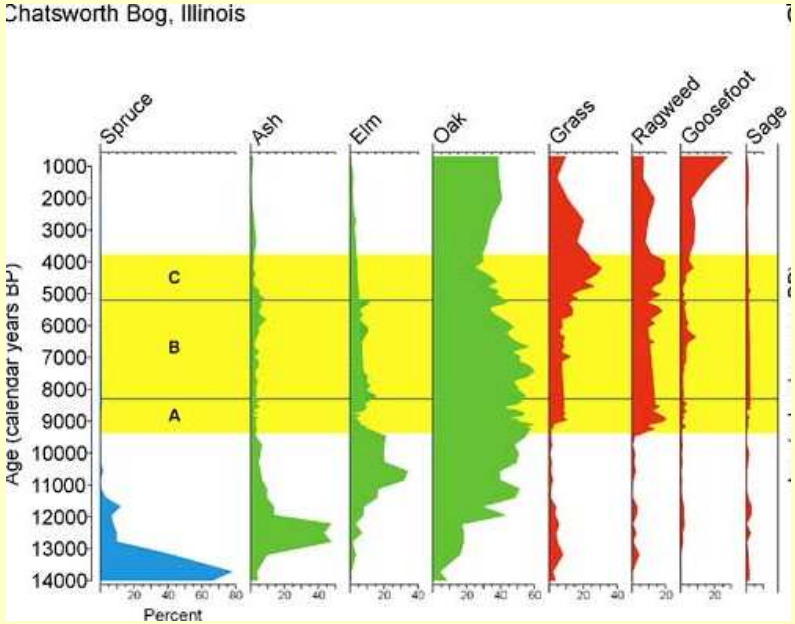
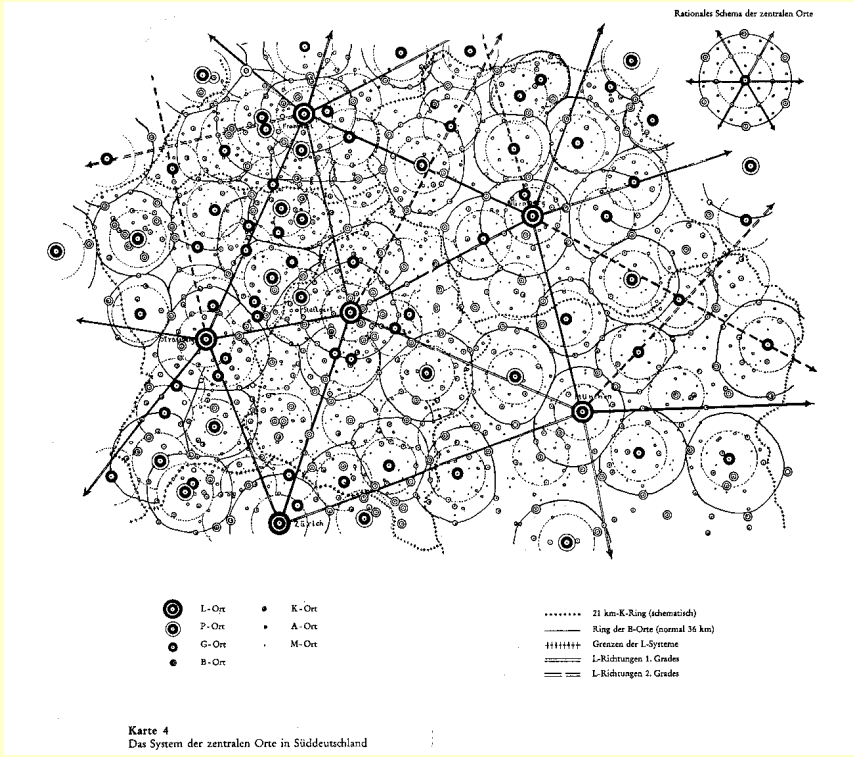


(Source: http://www.museum.state.il.us)

Maps that Matter

Walter Christaller: Central Place Theory 1933

- First published in Christaller's 1933 monograph *Die Zentralen Orte in Süddeutschland (Central Places in Southern Germany)*, which was translated to English in 1966.
- Location theory delimiting rules governing the distribution, size, number and function of towns, predicting ideal development of settlement.
- Popularized by Berry and Bunge in 1960s, for emphasis on spatial organisation and regularities.
- Icon of the quantitative revolution, with long-lasting impact on school curricula.



(Source: Christaller W. (1933) *Die Zentralen Orte in Süddeutschland*. Jena: Gustav Fischer)

Maps that Matter

Christaller-inspired Google Earth mash-up, 2008

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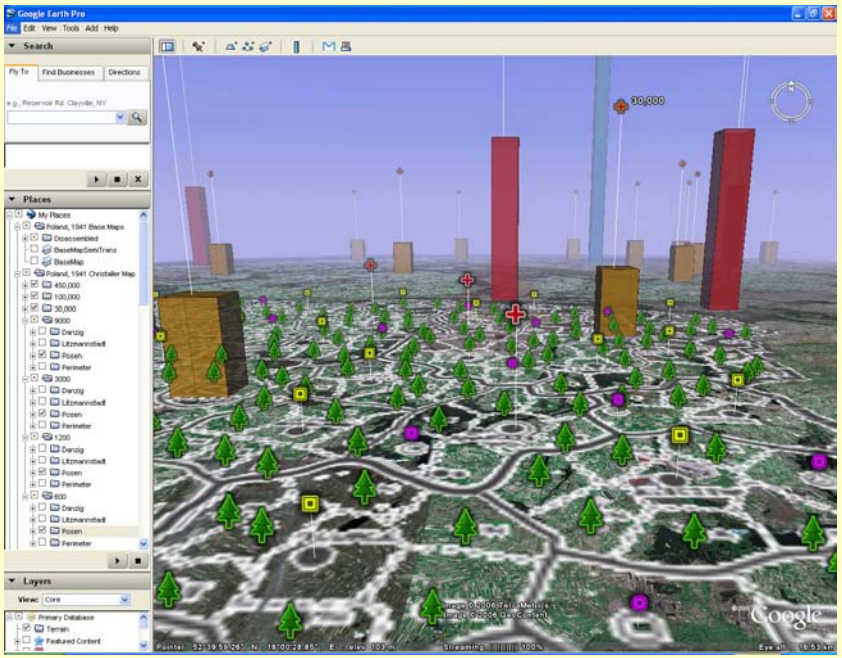
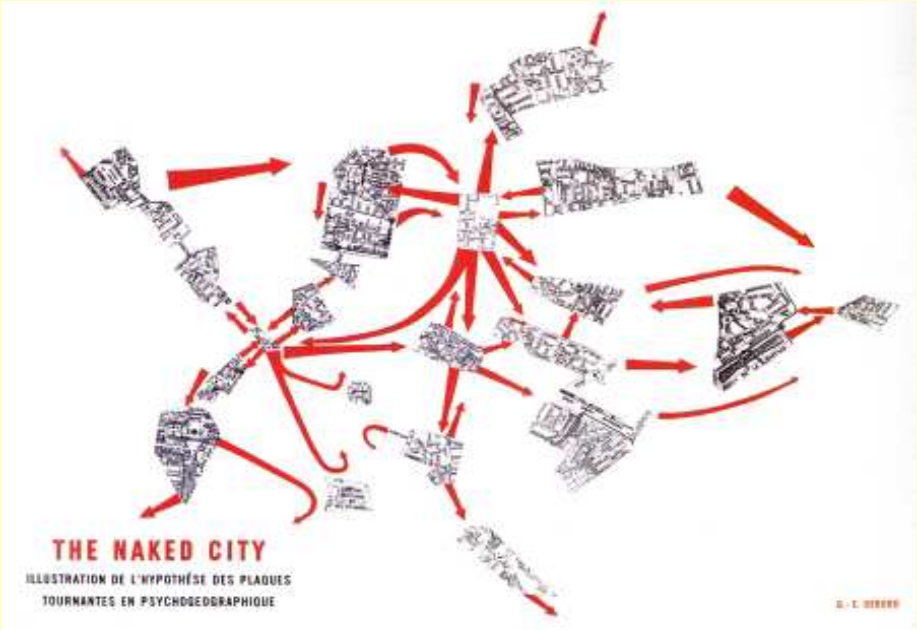


(Source: www-personal.umich.edu/~copyrght/image/solstice/win06/Germany/indexPartII.html)

Maps that Matter

Guy Debord: The Naked City, The Situationist 1957

- This subversive mapping was exhibited in 1957 in the First Psychogeographic Exhibition in Paris.
- Strongly iconic of alternative re-imaginings of the city and of the non-representational turn in cultural geography – inspiring numerous contemporary derives and artistic and activist engagements with the urban condition; e.g. Christian Nold's biomapping of emotions.



(Source: http://www.intelligentagent.com/archive/Vol6_No2_interactive_city_sant.htm)

Maps that Matter

Debord-inspired Emotion mapping of London 2004

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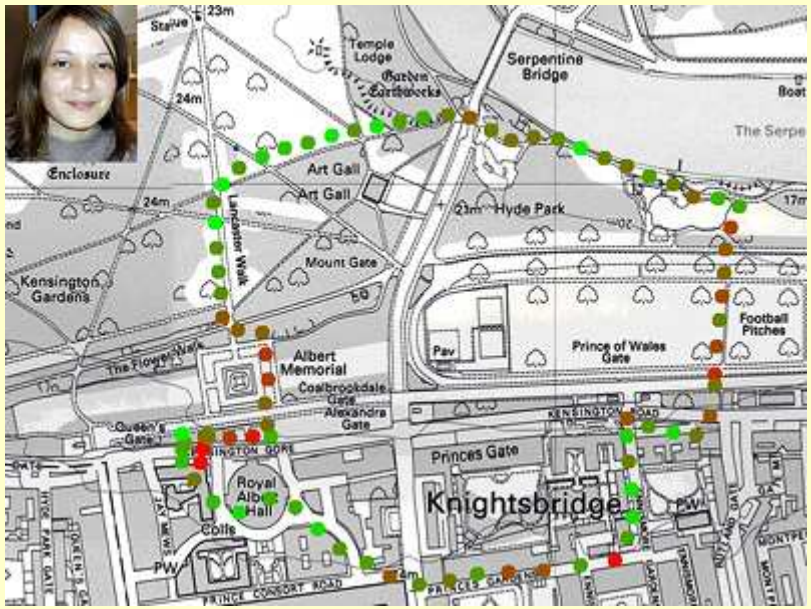
Mapping emotional arousal around the Royal Geographical Society……

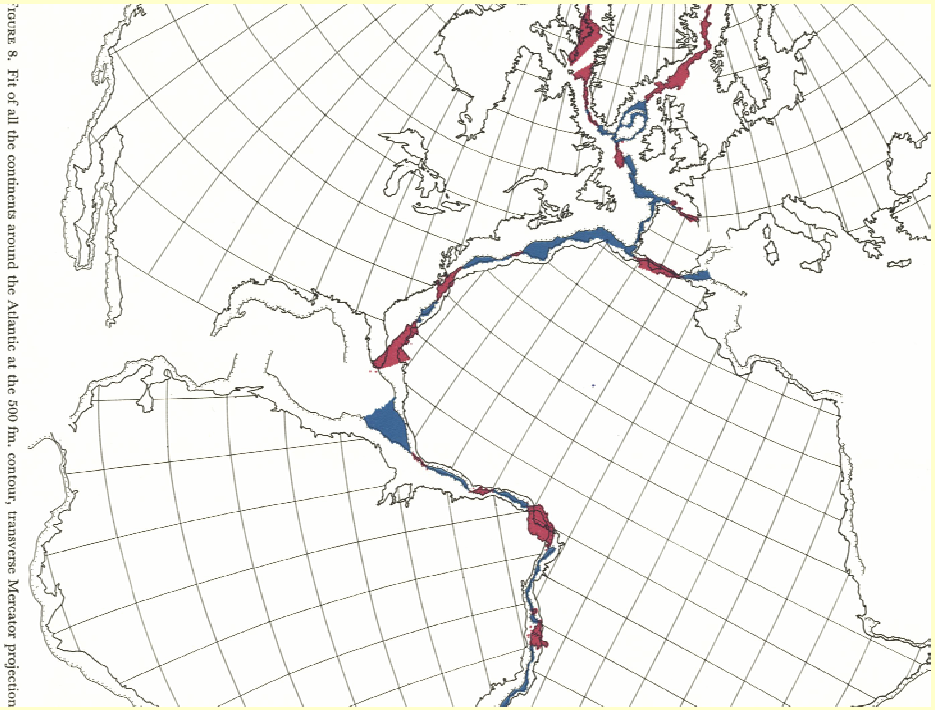


(Source: http://www.biomapping.net/old.htm)

Maps that Matter

Sir Edward Bullard: The 'Bullard Fit' – Continental Drift 1965

- Published in a 1965 research article by Bullard et al, *The Fit of the Continents Around the Atlantic* in Royal Society of London Philosophical Transactions.
- Anteceded by numerous mappings of the apparent Atlantic fit of continents (notably Alfred Wegener's *Origin of the Continents and Oceans)* Bullard and his co-workers produced the first computer-generated map of the 1000 metre isobath fit, and in so doing contributed to the plate tectonic revolution.



(Source: http://www.jstor.org/stable/pdfplus/73331.pdf)

Maps that Matter

Continental drift without the mechanism

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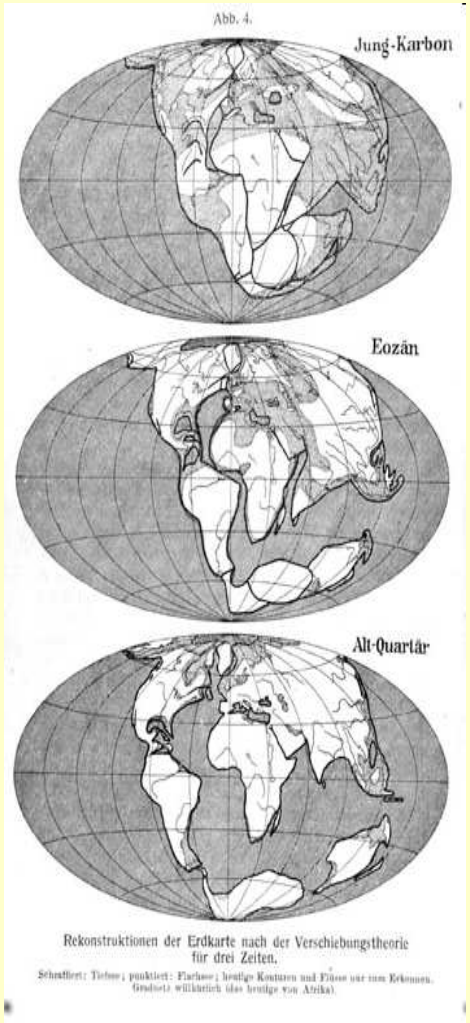

(Source: Wegener A. (1915) *Origin of the Continents and Oceans*)

Maps that Matter

Torsten Hägerstrand: Time-Space Geography Model 1970

- Published in Hägerstrand's influential 1970 article, *What About People in Regional Science?* in Papers of the Regional Science Association.
- Notion and visualization of space-time paths encouraged a consideration of time as part of social life instead of just an external influence.
- Continuing influence on wide range of disciplines across social sciences, including in GIScience; e.g. Mei-Po Kwan's 3D 'fishtank' visualisations.

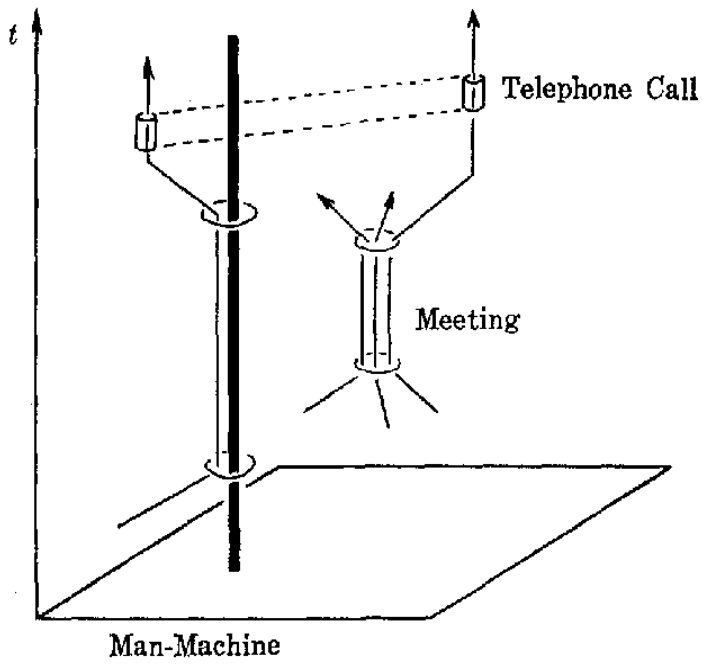

FIGURE 2. Grouping of Several Paths

(Source: http://www3.interscience.wiley.com/journal/119702350/abstract)

Maps that Matter

Hägerstrand-inspired Kwan's GIS-generated space time paths, 2004

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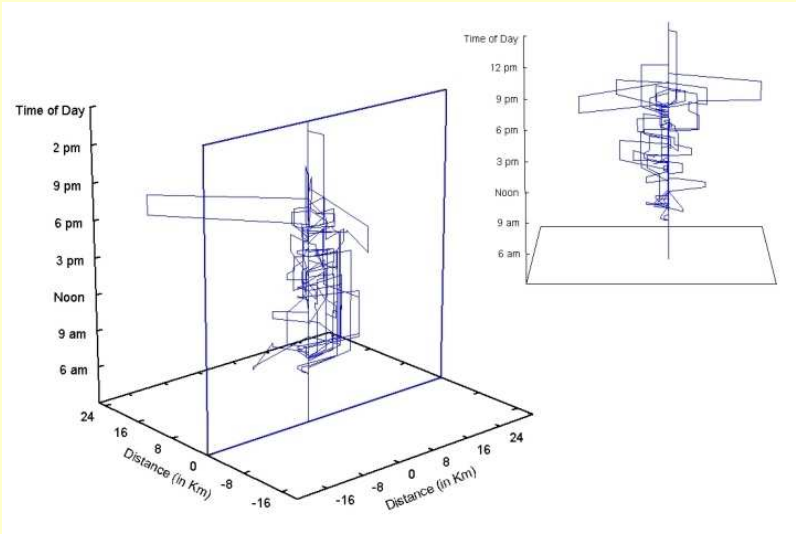
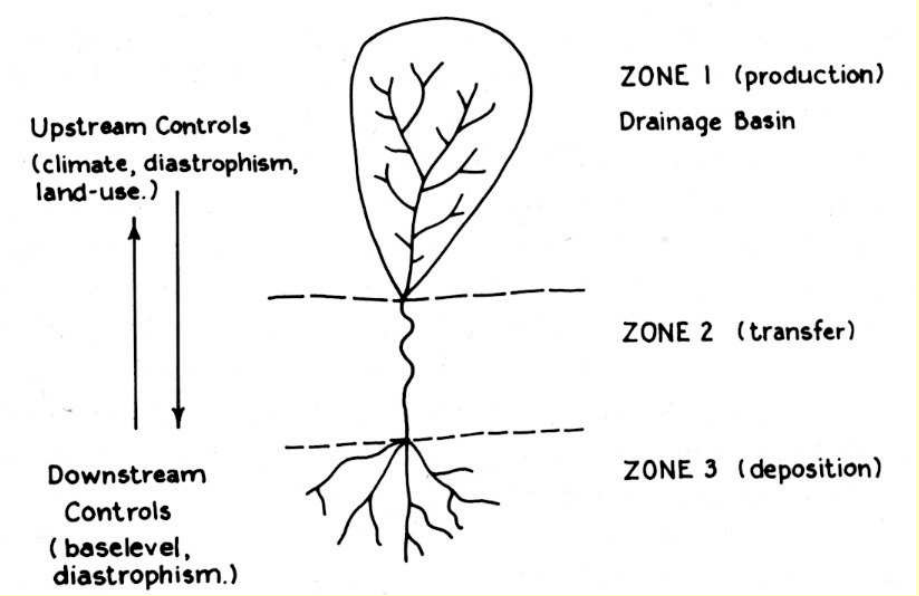


(Source: http://geog-www.sbs.ohio-state.edu/faculty/mkwan/Gallery/STPaths.htm)

Maps that Matter

Stanley Schumm: Drainage basin as sediment transfer system 1977

- Published in Schumm's 1977 research monograph *The Fluvial System*, this simple heuristic model stresses the relations between form and process in fluvial systems.
- Frequently used in teaching it comes to represent the turn towards process that dominates much contemporary geomorphology.



(Source: Schumm S.A. (1977) *The Fluvial System*, New York, Wiley)

Maps that Matter

Schumm-inspired Drainage basin diagram

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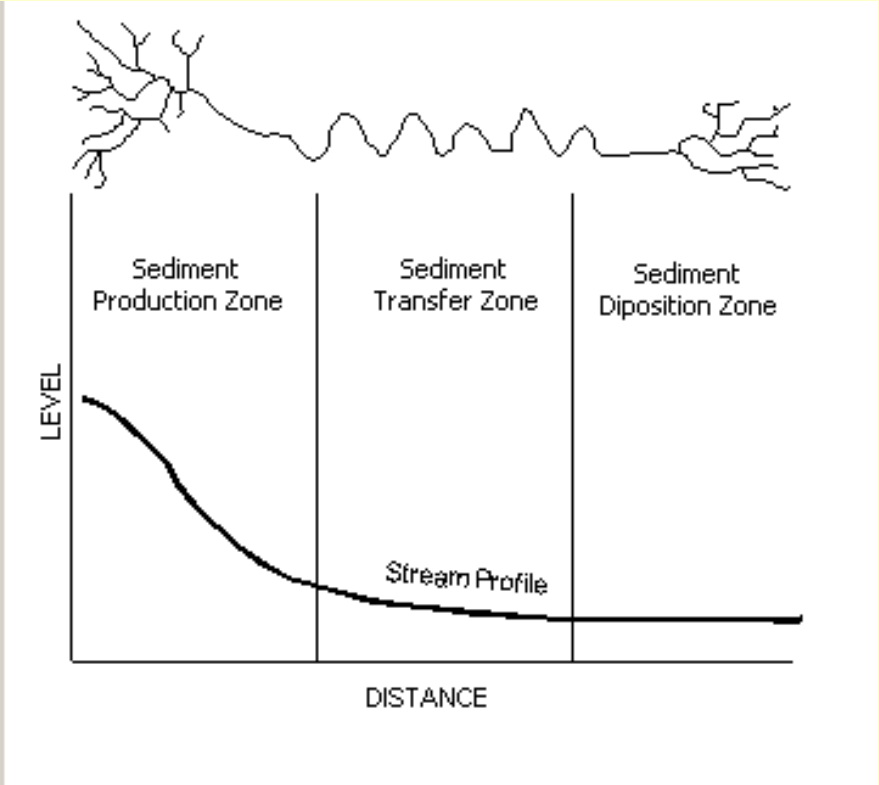
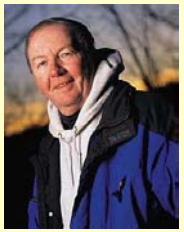


(Source: Newson M. (1992) *Land Water and Development*, London, Routledge)

Maps that Matter

Richard S Stolarski & co-workers: Mapping the ozone hole 1986



- Original *Nature* article on the 'discovery' of the Antarctic ozone hole in 1985 (Farman et al) included no mapping of the geographical extent of the hole.
- Perhaps the first sequence of maps of the hole appeared in 1986 Nature article by Stolarski et al, *Nimbus-7 Satellite Measurements of the Springtime Antarctic Ozone Decrease*.
- Proliferation of subsequent visualisations, with many web served maps available, of the changing severity of the issue.

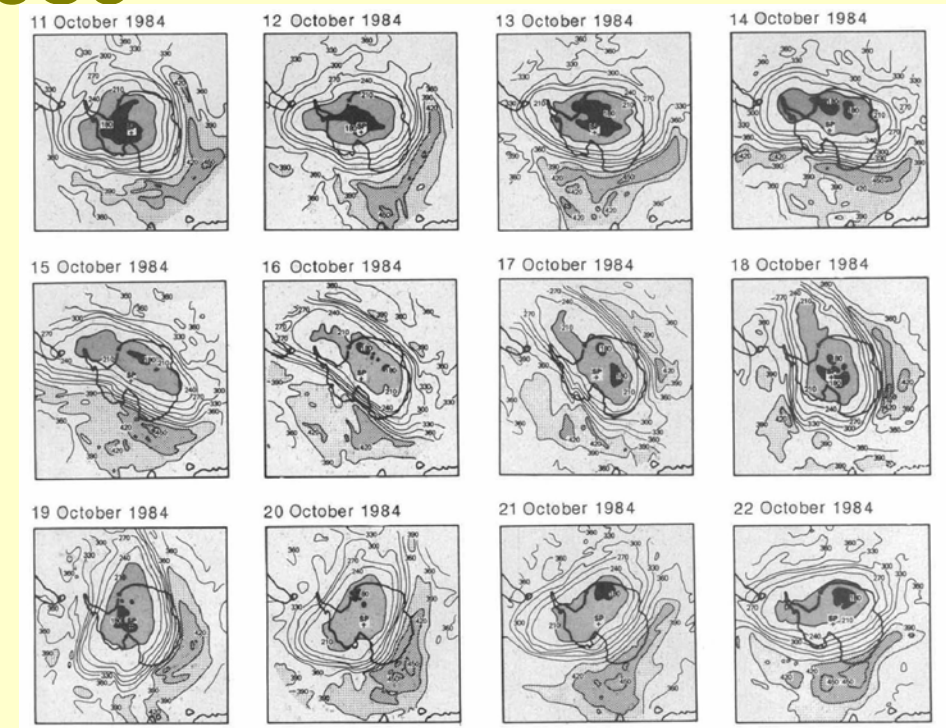


Fig. 1 Twelve-day sequence (11–22 October 1984) of TOMS measurements of total ozone content. The data are shown in south-polar projections, with the pole indicated by a cross (SP) and Halley Bay shown by an asterisk. Contours are every 30 Dobson units (1 DU = 10^{-3} atm cm). The region shown extends to ~45° latitude and the Greenwich meridian is towards the top of each diagram. Shaded regions indicate total ozone values <180 and 210 DU and >390 and 420 DU.

(Source: http://www.nature.com/nature/journal/v322/n6082/abs/322808a0.html)

Maps that Matter

Dramatic re-mapping the ozone hole

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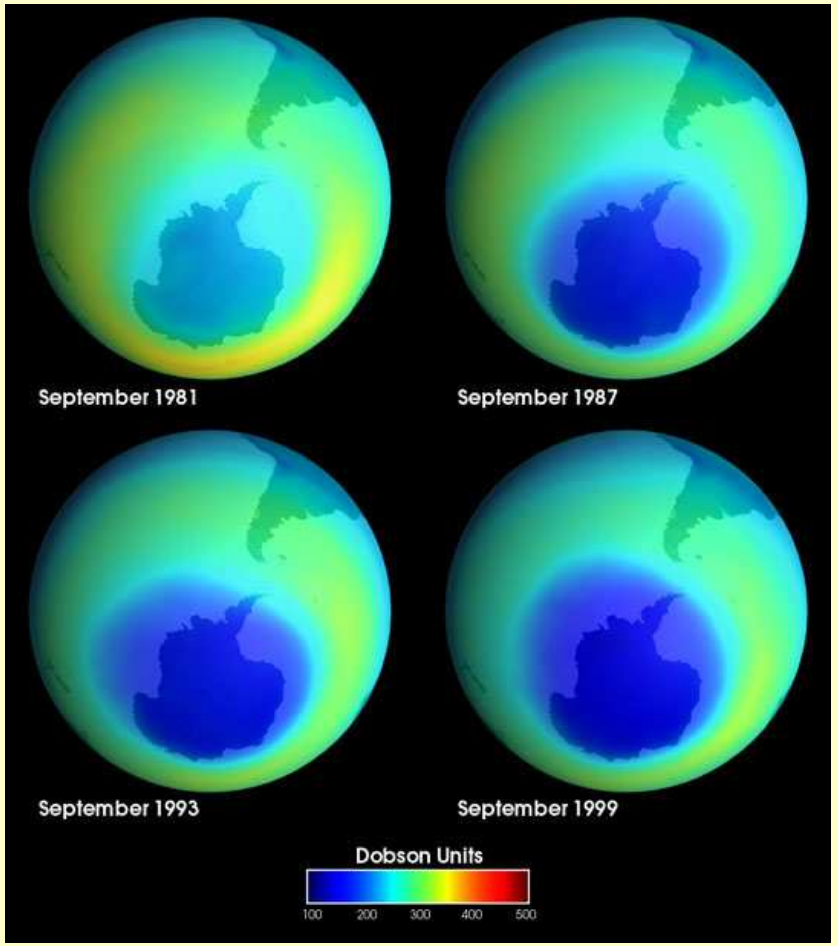
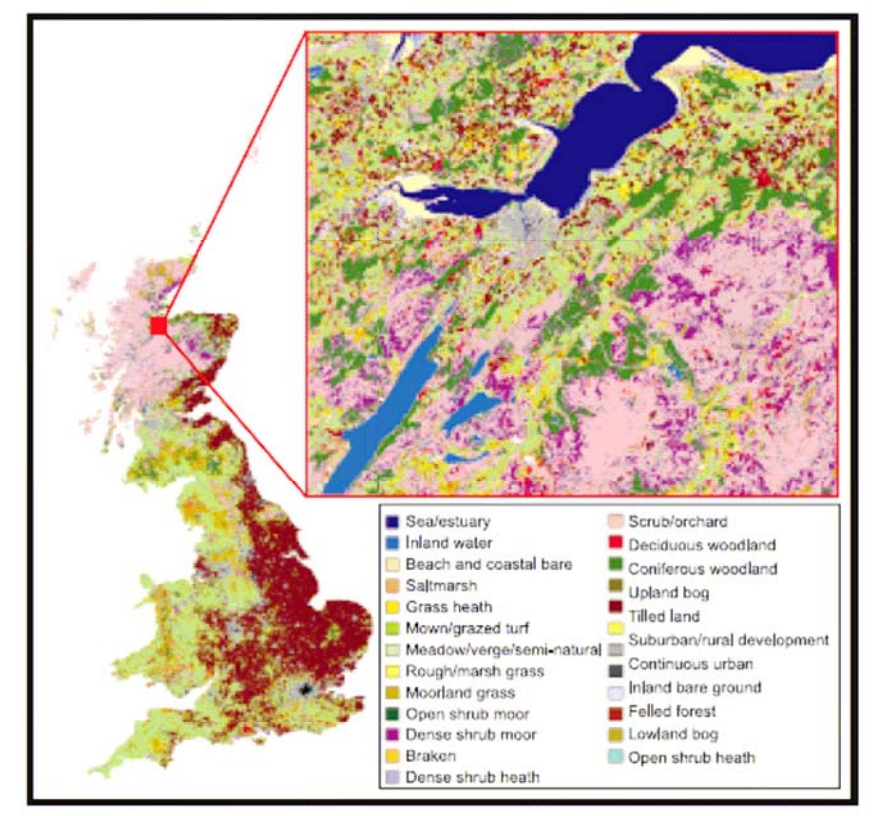


(Source: http://earthobservatory.nasa.gov)

Maps that Matter

Robin Fuller and co-workers: ITE Land Cover Map of Britain 1993

- Pioneering digital processing of LANDSAT TM satellite imagery to produce a useful 25 class land cover map of Britain. Described in 1994 research article by Fuller et al, *The Land Cover Map of Great Britain: An Automated Classification of Landsat Thematic Mapper Data* in the journal Photogrammetric Engineering and Remote Sensing.
- The work has had significant impacts across discipline, offering one of first automated processes of land cover database compilation.

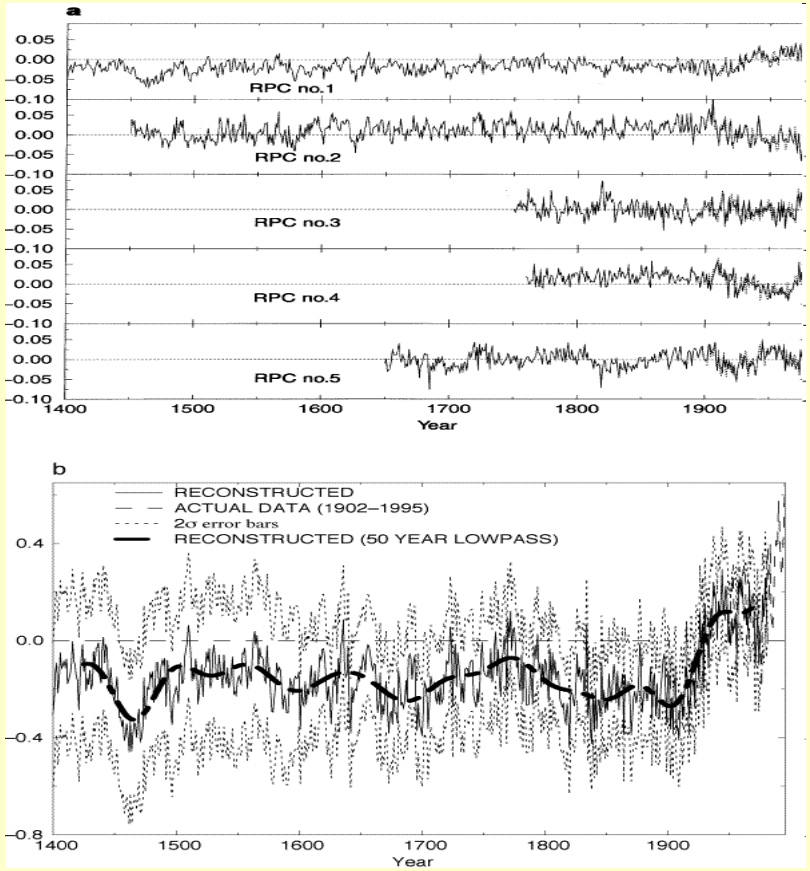


(Source: http://www.ceh.ac.uk/products/publications/documents/23global2.pdf)

Maps that Matter

Michael E. Mann & co-workers: 'Hockey stick' global warming graph 1998

- Published in an influential 1998 Nature article, Mann et al, *Global-Scale Temperature Patterns and Climate Forcing Over the Past Six Centuries*.
- Visualization of implied anthropogenic induced global warming provoked significant controversy and frequent reworkings of both data series and its representation, for example in the Third IPCC report.

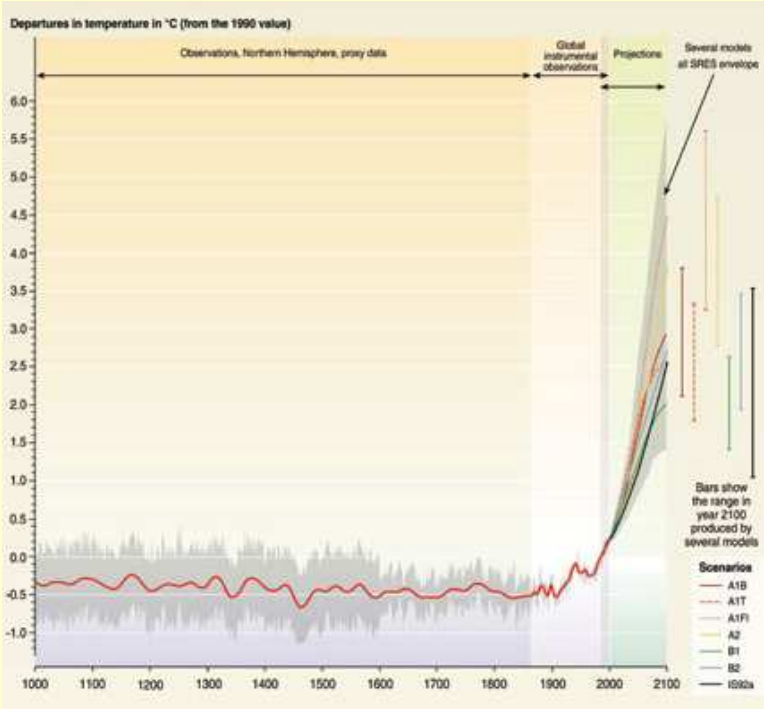


(Source: http://www.nature.com/nature/journal/v392/n6678/pdf/392779a0.pdf)

Maps that Matter

Reactions to the ‘hockey stick’

- Visualization of implied anthropogenic induced global warming provoked significant controversy and frequent re-workings of both data series and its representation, for example in the Third IPCC report.
- “The hockey stick, the poster-child of the global warming community, turns out to be an artifact of poor mathematics”

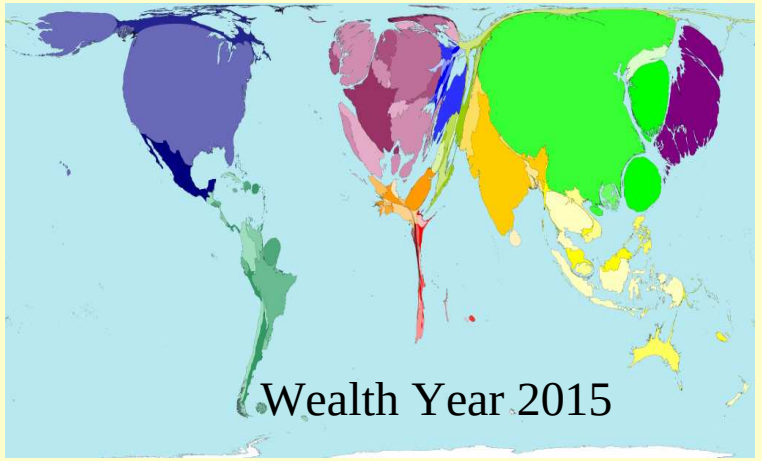


(Source: http://www.nature.com/nature/journal/v441/n7097/full/4411032a.html)

Maps that Matter

Danny Dorling & co-workers: Worldmapper project 2004 - ongoing

- Mark Newman and Michael Gastner published code to generate an equal area cartogram in 2004.
- Danny Dorling and co-workers deployed this code and applied it to publicly available datasets from 2004.
- Published online from www.worldmapper.org and also available as pdf posters, represents values by areas but preserves the aesthetics of relative geographic position in striking images depicting global inequalities.



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Newman and Gastner Cartograms

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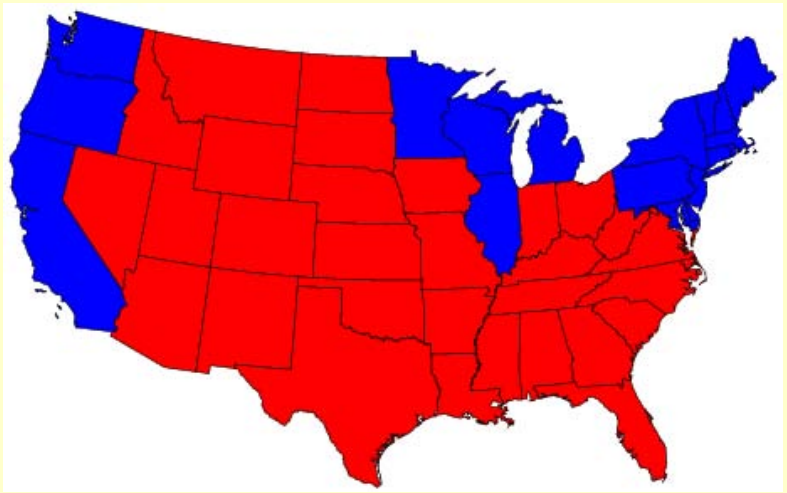
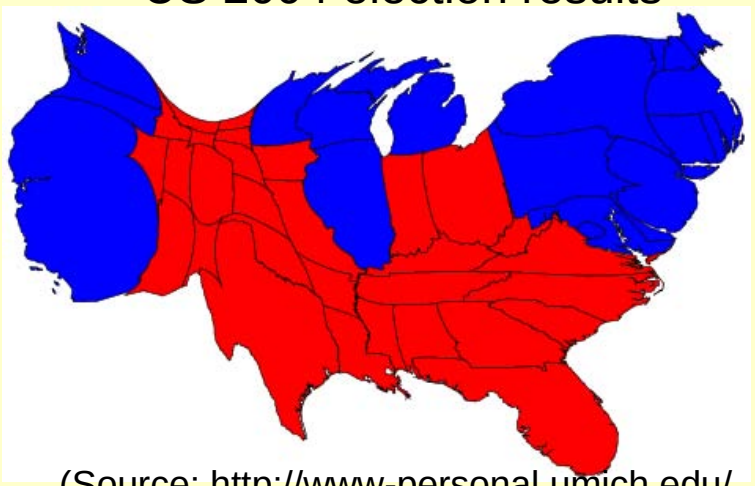


US 2004 election results



(Source: http://www-personal.umich.edu/~mejn/election/)