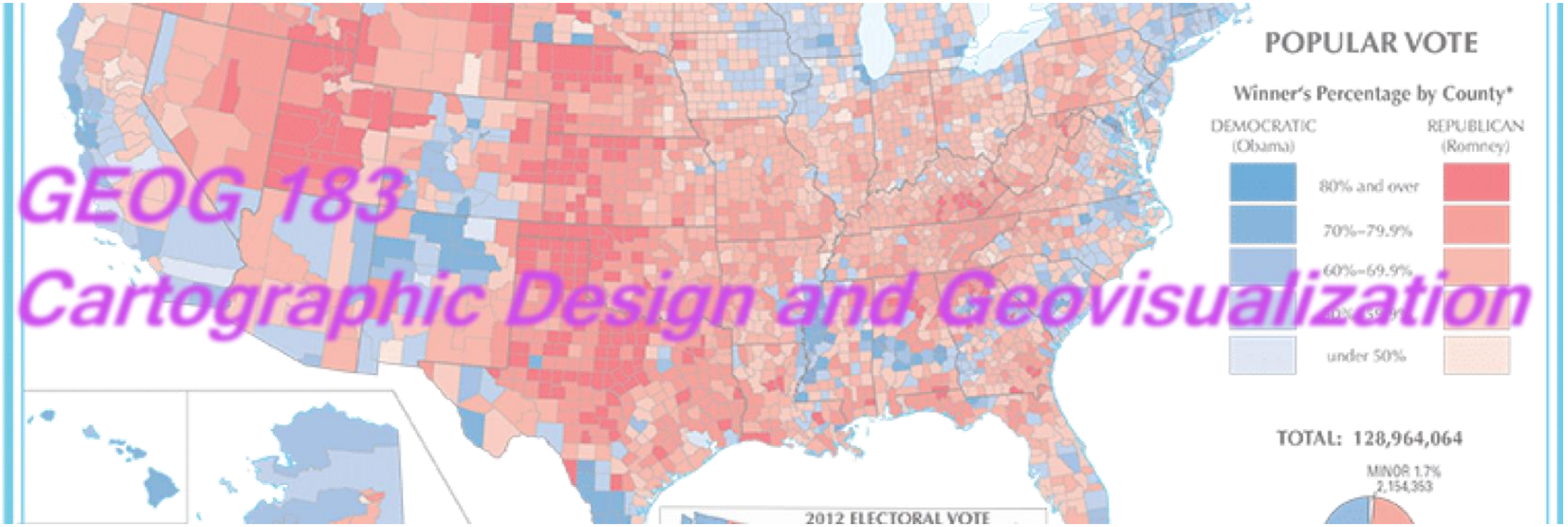


Geog183: Cartographic Design and Geovisualization Spring Quarter 2020

Lecture 18: Research in Cartography and Visualization

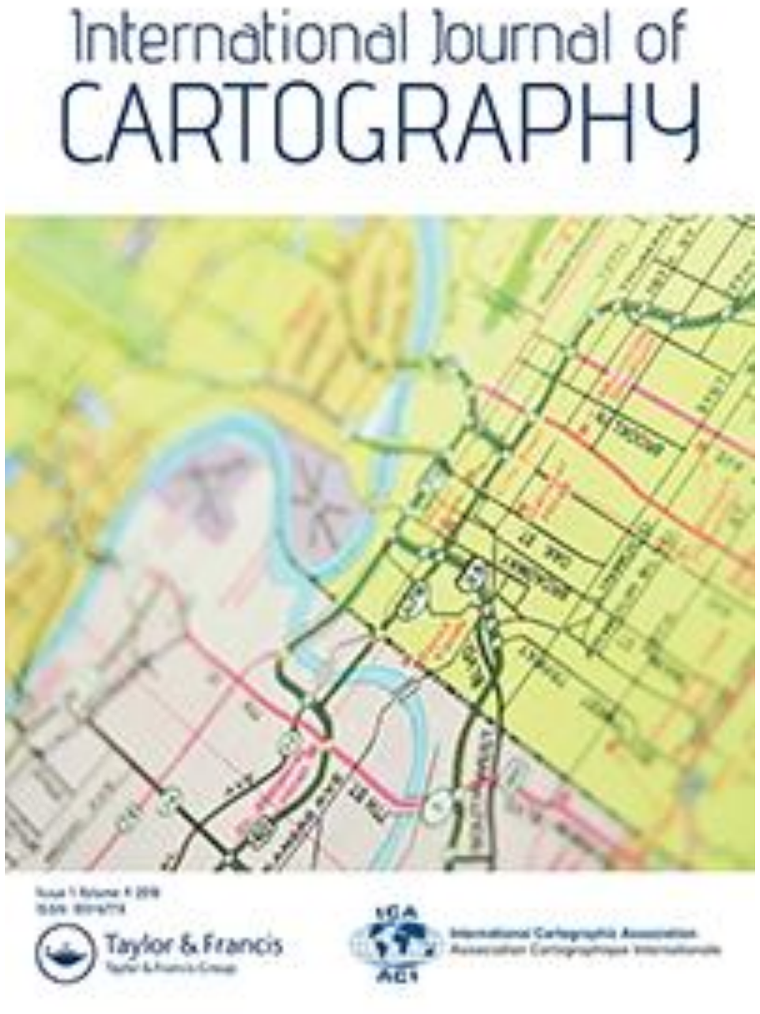
Key Journals

TABLE 26.1 Journals and conference proceedings containing articles dealing with thematic cartography and geovisualization

Primary journals
Cartographic Perspectives
Cartographica
Cartography
Cartography and Geographic Information Science
The Cartographic Journal
Secondary journals
Annals, Association of American Geographers
Byte
Computer Graphics
Computers & Geosciences
Environment and Planning A
Environment and Planning B: Planning and Design
Geographical Analysis
Geospatial Solutions
GEOWorld
IEEE Computer Graphics & Applications
IEEE Transactions on Visualization and Computer Graphics
Information Visualization
International Journal of Geographical Information Science
International Journal of Human-Computer Studies
Journal of Geography
Journal of the American Statistical Association
Landscape and Urban Planning
Photogrammetric Engineering and Remote Sensing
Presence
Progress in Human Geography
Statistical Computing & Statistical Graphics Newsletter
The American Statistician
The Professional Geographer
Transactions in GIS
Transactions, Institute of British Geographers
Proceedings
ACM SIGGRAPH (Association for Computing Machinists, Special Interest Group on Graphics and Interactive Techniques)
ICA (International Cartographic Association)
Innovations in GIS (Proceedings of the U.K. National Conference on GIS Research: GISRUK)
International Symposium on Spatial Data Handling (International Geographical Union)
Visualization (IEEE)

Note: For proceedings, the name of the sponsoring organization is provided in parentheses.

International Journal of Cartography

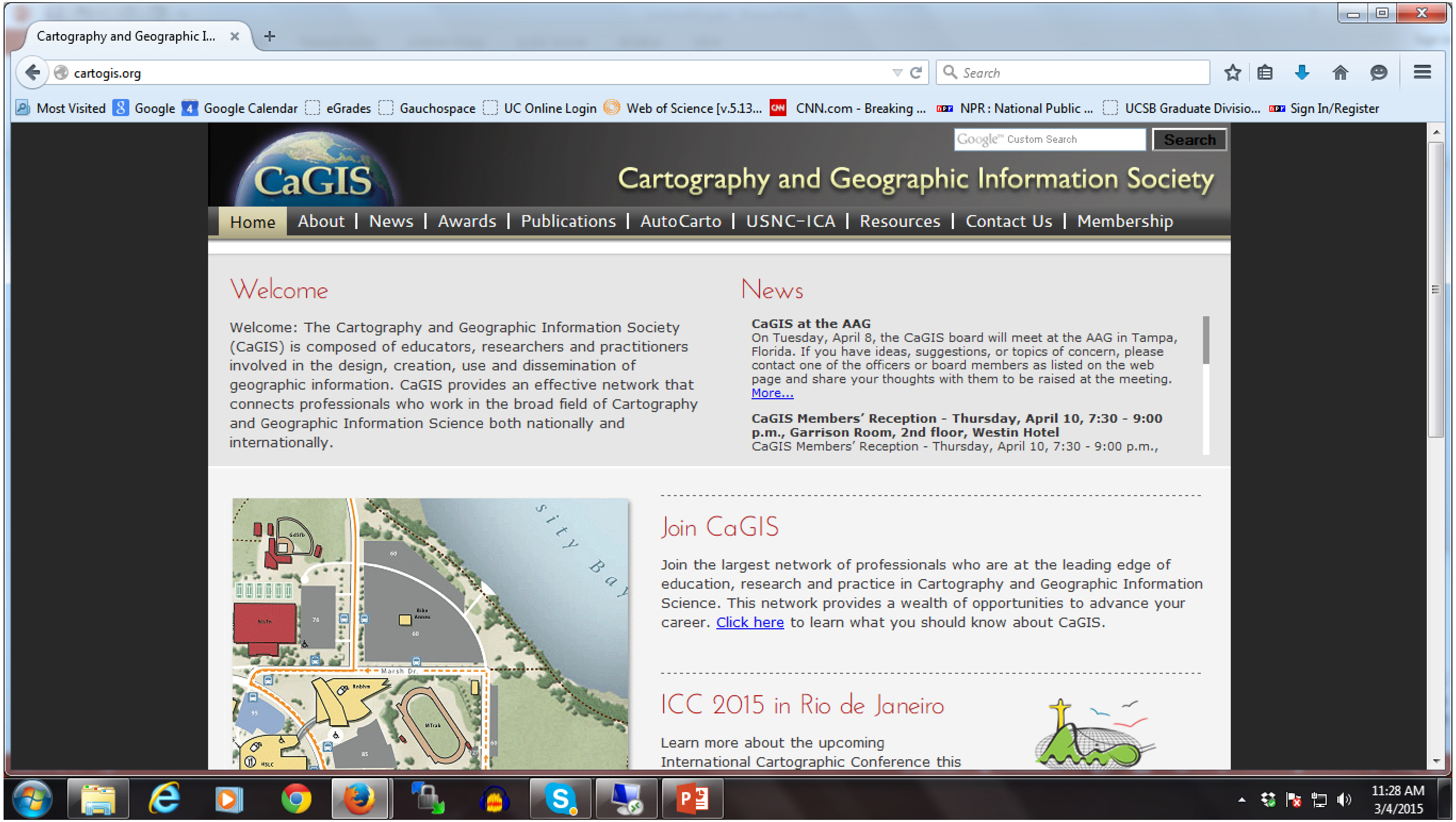


Professional Organizations

TABLE 26.2 Conferences having topics of interest to cartographers

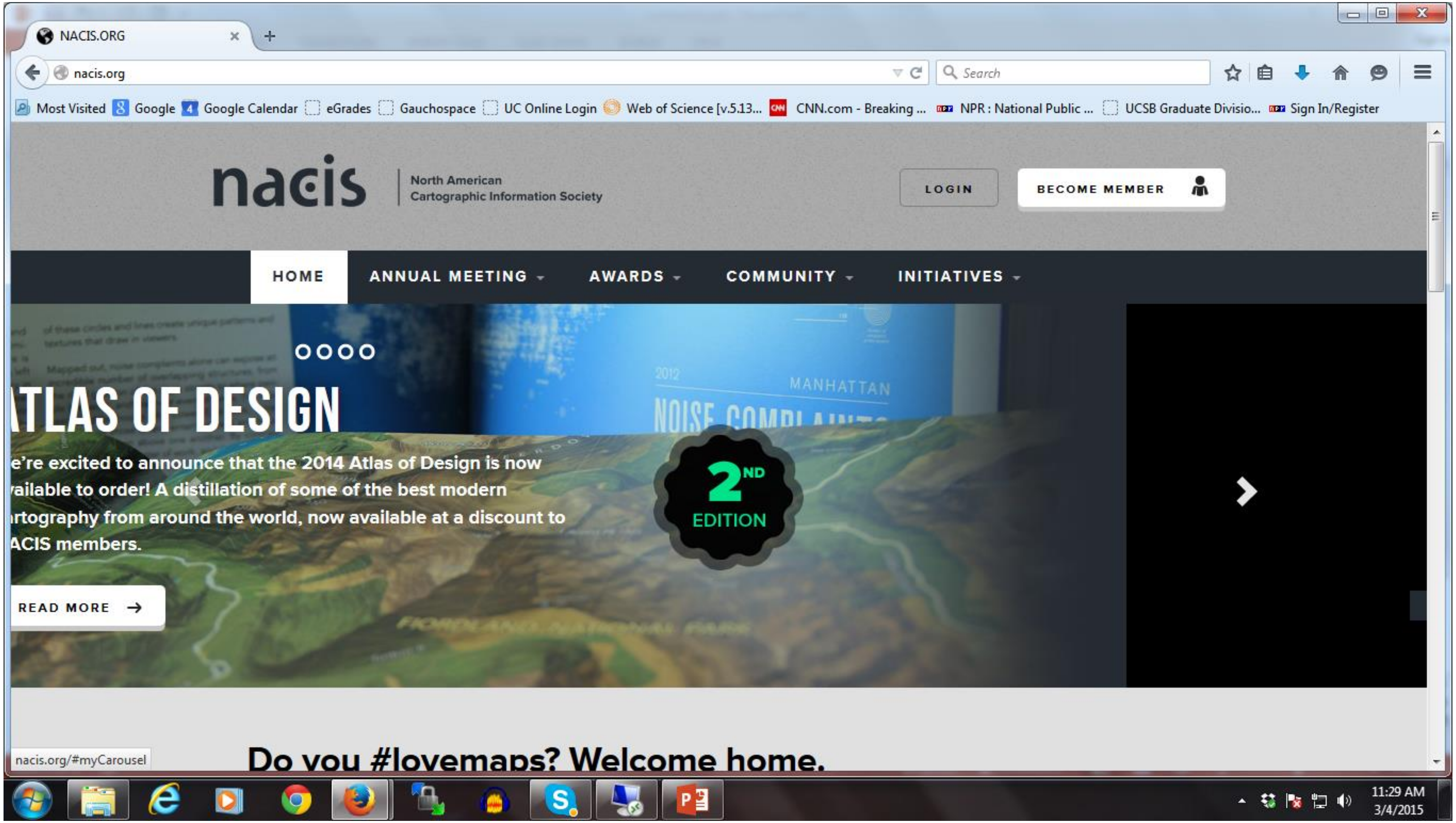
AAG (Association of American Geographers)
ACM SIGGRAPH (Association for Computing Machinists, Special Interest Group on Graphics and Interactive Techniques)
ACSM/ASPRS Annual Convention (American Congress on Surveying and Mapping)
ESRI International User Conference (ESRI)
GIScience (University Consortium for Geographic Information Science)
ICA (International Cartographic Association)
International Symposium on Spatial Data Handling (International Geographical Union)
NACIS (North American Cartographic Information Society)
Visualization (IEEE)

CaGIS



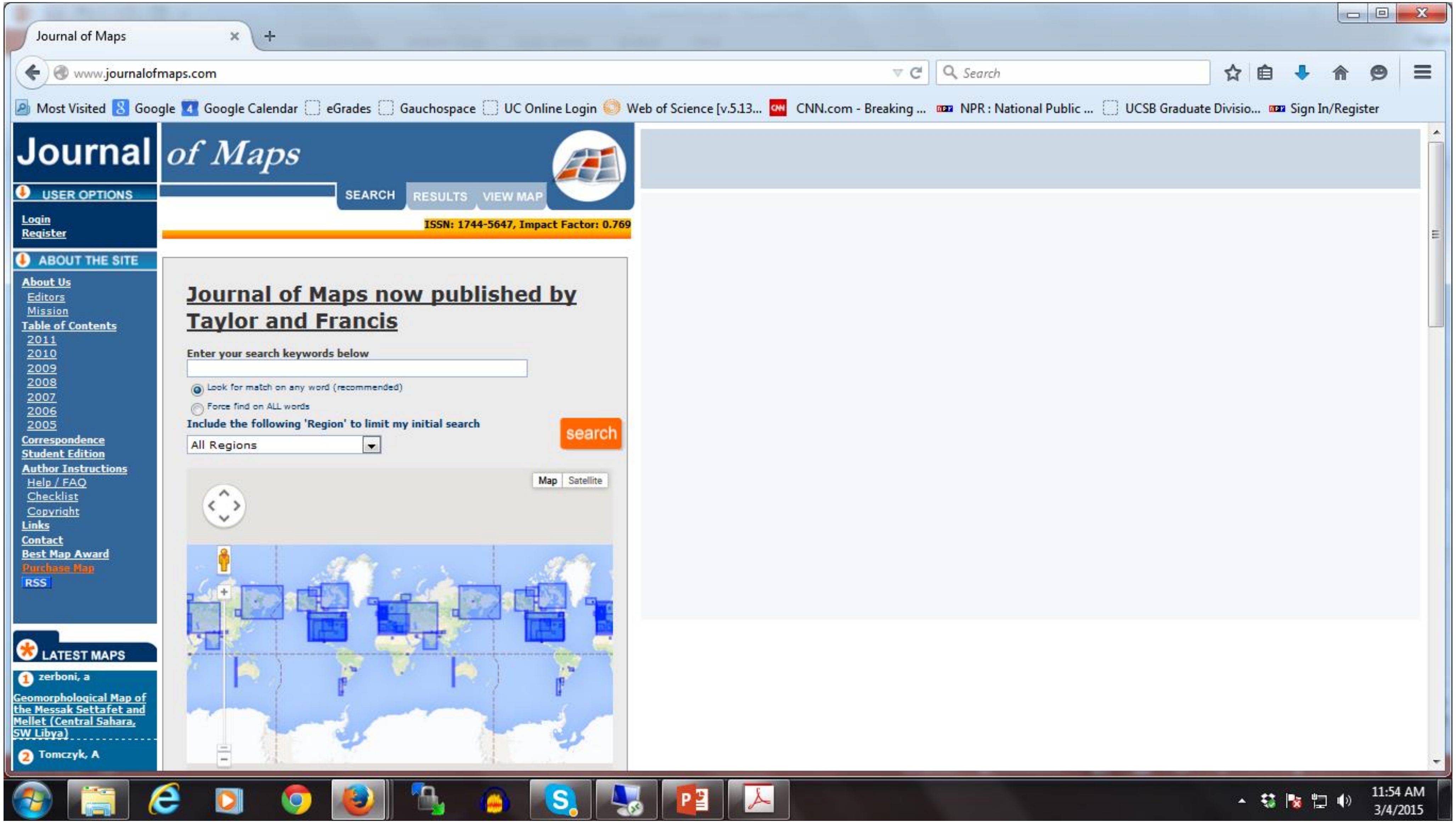
Cartography and Geographic I...
cartogis.org
Search
Most Visited
Google
Google Calendar
eGrades
Gauchospace
UC Online Login
Web of Science [v.5.13...
CNN.com - Breaking ...
NPR : National Public ...
UCSB Graduate Divisio...
Sign In/Register
Google Custom Search
Search
CaGIS
Cartography and Geographic Information Society
Home | About | News | Awards | Publications | AutoCarto | USNC-ICA | Resources | Contact Us | Membership
Welcome
Welcome: The Cartography and Geographic Information Society (CaGIS) is composed of educators, researchers and practitioners involved in the design, creation, use and dissemination of geographic information. CaGIS provides an effective network that connects professionals who work in the broad field of Cartography and Geographic Information Science both nationally and internationally.
News
CaGIS at the AAG
On Tuesday, April 8, the CaGIS board will meet at the AAG in Tampa, Florida. If you have ideas, suggestions, or topics of concern, please contact one of the officers or board members as listed on the web page and share your thoughts with them to be raised at the meeting.
More...
CaGIS Members' Reception - Thursday, April 10, 7:30 - 9:00 p.m., Garrison Room, 2nd floor, Westin Hotel
CaGIS Members' Reception - Thursday, April 10, 7:30 - 9:00 p.m.,
Join CaGIS
Join the largest network of professionals who are at the leading edge of education, research and practice in Cartography and Geographic Information Science. This network provides a wealth of opportunities to advance your career. Click here to learn what you should know about CaGIS.
ICC 2015 in Rio de Janeiro
Learn more about the upcoming International Cartographic Conference this
11:28 AM
3/4/2015

NACIS



NACIS.ORG
nacis.org
Most Visited
Google
Google Calendar
eGrades
Gauchospace
UC Online Login
Web of Science [v.5.13...
CNN.com - Breaking ...
NPR : National Public ...
UCSB Graduate Divisio...
Sign In/Register
nacis
North American Cartographic Information Society
LOGIN
BECOME MEMBER
HOME
ANNUAL MEETING
AWARDS
COMMUNITY
INITIATIVES
TLAS OF DESIGN
e're excited to announce that the 2014 Atlas of Design is now
ailable to order! A distillation of some of the best modern
rtography from around the world, now available at a discount to
ACIS members.
READ MORE
MANHATTAN
2ND EDITION
Do you #lovemaps? Welcome home.
nacis.org/#myCarousel
11:29 AM
3/4/2015

Journal of Maps

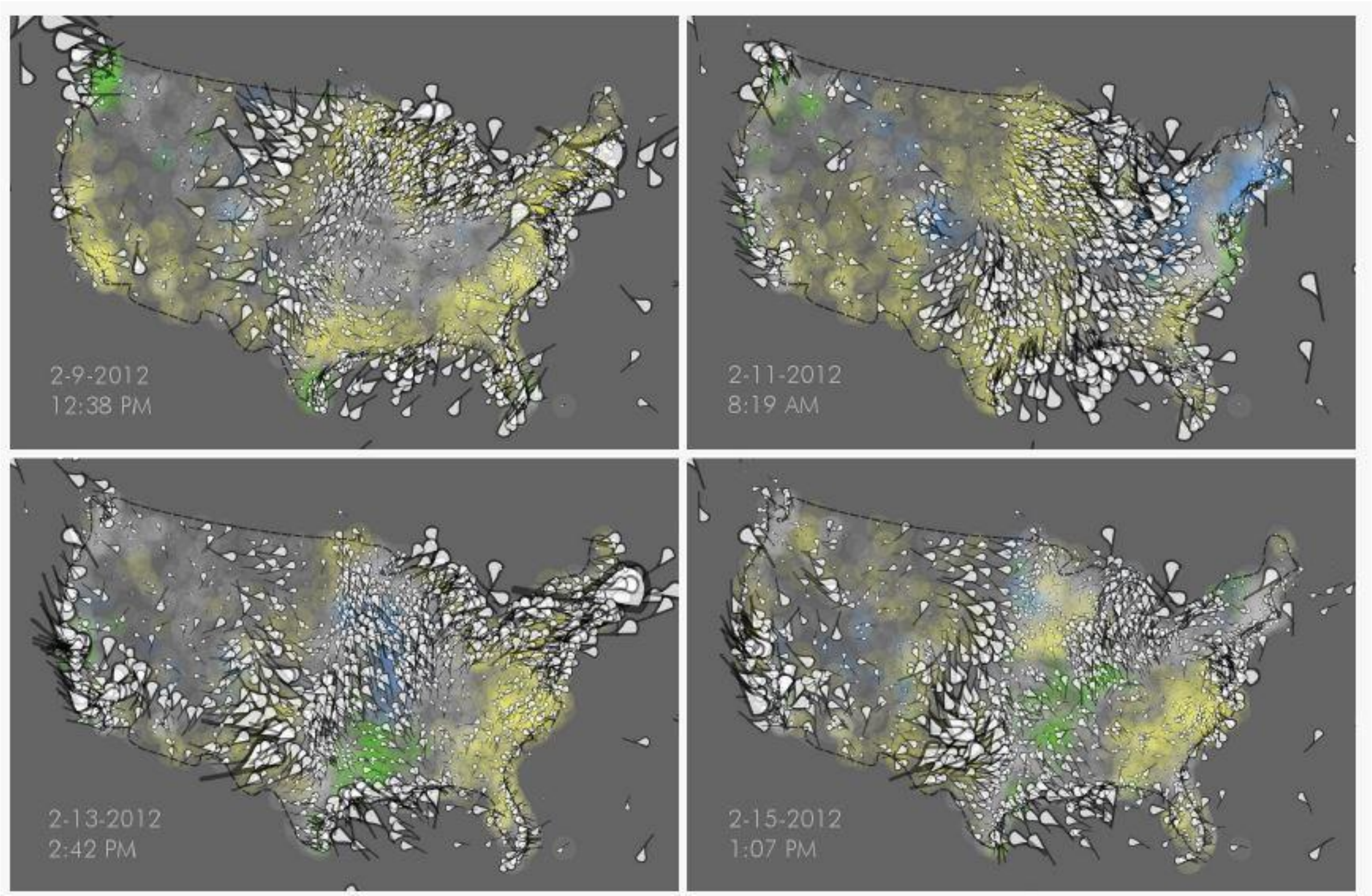


Cartography Blogs

- http://mycarta.wordpress.com/
- http://artcarto.wordpress.com/
- http://bigthink.com/blogs/strange-maps
- http://mappingcenter.esri.com/ {ESRI Centric}
- http://kelsocartography.com/blog/
- http://www.mapsandthecity.com/
- http://gis.blogoverflow.com/tag/cartography-2/
- http://cartonerd.blogspot.co.uk/
- http://mapperz.blogspot.com/
- http://gretchenpeterson.com/
- http://www.cartogrammar.com/blog/
- http://www.radicalcartography.net/
- http://samplecartography.com/work.html
- http://www.maproomblog.com/
- http://www.bigmapblog.com/
- http://somethingaboutmaps.wordpress.com/
- http://mapoftheweek.blogspot.com/
- http://timwallace.wordpress.com/
- http://makingmaps.net/
- http://flowingdata.com/
- http://indiemaps.com/blog/
- http://chadrobin.blogspot.com/
- http://oliviasmapcatalog.blogspot.com
- http://makingmaps.net/
- http://andywoodruff.com/blog/
- http://cartastrophe.wordpress.com/
- http://cartophile.tumblr.com/

Portraits of Wind: *Cartographic Perspectives*
Tim Sinnott: tim@greeninfo.org | @tsinn

SINNOTT, T.. Portraits of Wind. Cartographic Perspectives, North America, 0, jan. 2014. Available at: <http://www.cartographicperspectives.org/index.php/journal/article/view/cp74-sinnott/1256>. Date accessed: 04 Mar. 2015.



"I parsed and compiled individual XML files into one large CSV, opened it in Quantum GIS, and got to mapmaking. After drawing and discarding roughly 20 iterations of SVG symbols representing wind—ranging from spirals to raindrops—I finally created a simple icon that I felt expressed the movement and strength of wind without overwhelming the viewer. The CSV file gave me latitude and longitude values to place my wind points on the map. Fields for wind direction and speed allowed me to rotate and size the icons. "

Andrew Wheeler (2015) Visualization techniques for journey to crime flow data, *Cartography and Geographic Information Science*, 42:2, 149-161, DOI: 10.1080/15230406.2014.890545

Figure 1. Connecting the JTC lines frequently creates a very complicated graphic with extreme overplotting of the lines. This is a demonstration of 4500 (simulated) JTC lines for Baltimore county Maryland that come as example data with the CrimeStat spatial statistics program. The map on the left is the default in ESRI's ArcGIS software. A simple improvement over the initial default drawing of JTC lines is to make the line elements smaller, and draw them with semitransparency, shown in the map on the right.

Wheeler 2015: Journey to crime

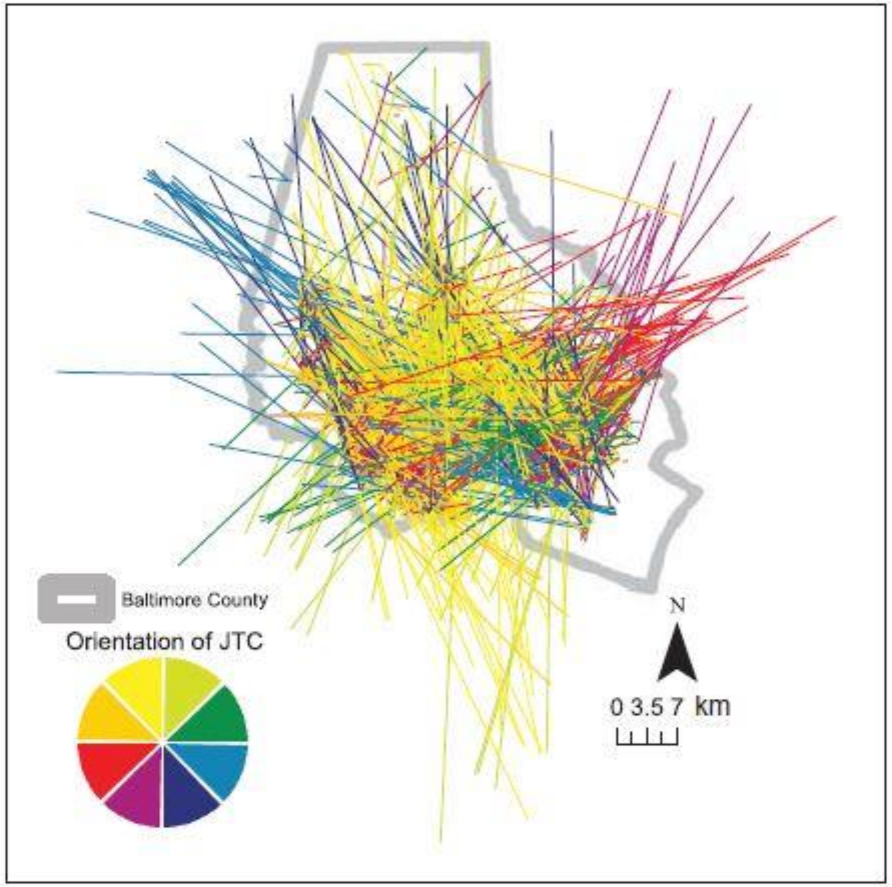


Figure 2. Using colors to visualize the direction of flow lines. This map shows how the direction of long flows is intrinsically dictated by the selection of crime events within one jurisdiction. For example if a crime happens to the east of Baltimore county the direction of the JTC has to be westerly to end up within Baltimore county.

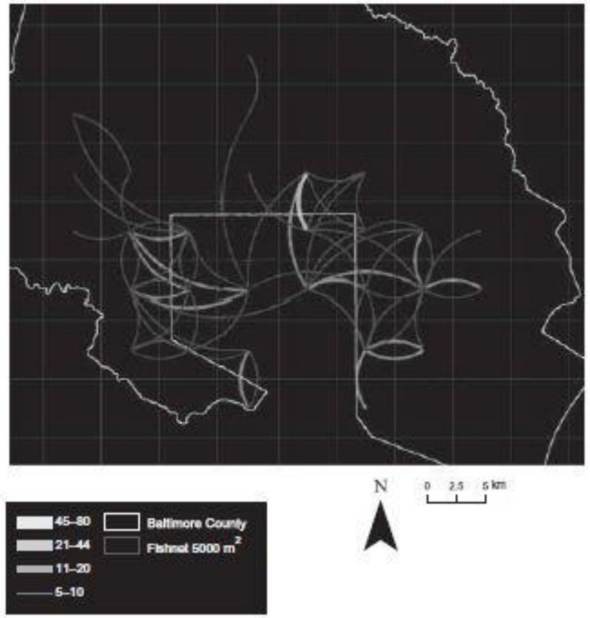


Figure 6. This map displays flow lines aggregated to quadrants of 5000 m^2. The map is displayed with a black background to provide greater contrast for smaller lines. Only flow lines of over five trips are displayed, and within quadrant trips are not displayed. Lines are drawn using Bézier curves, where the arc is always drawn clockwise, and the control point perpendicular to the midpoint of the line at a height of 0.3 times the length of the distance between the quadrant centroids.

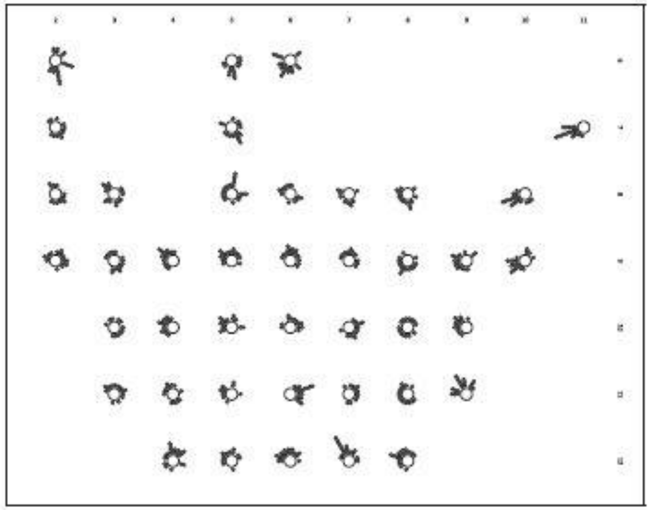


Figure 7. The dot plot histogram displays the directional azimuths of all JTCs originating from a particular quadrant. Facet numbers correspond to the column and row quadrants (starting from the upper left) presented in earlier maps (e.g. Figures 5 and 6). Because visualizing bar lengths in polar coordinates is difficult, as well as drawing axis labels, points are used to symbolize 5% of flows, for example two points means 10% of flows within the quadrant are traveling in that direction. Bins are 20° and centered at the midpoint. Only quadrants with at least 10 homes are displayed.

Alan M. MacEachren , Anthony Robinson , Susan Hopper , Steven Gardner , Robert Murray , Mark Gahegan & Elisabeth Hetzler (2005) Visualizing Geospatial Information Uncertainty: What We Know and What We Need to Know, *Cartography and Geographic Information Science*, 32:3, 139-160, DOI: 10.1559/1523040054738936

Data Quality \ Data Type	Positional Accuracy	Attribute Accuracy	Logical Consistency	Completeness	Lineage
Discrete Points and Lines	Size Shape (Error ellipses) (Epsilon bands)	Value Color Saturation (Feature code checks)	Color mixing Redundancy by overprinting Slivers by solid fills (Topological cleaning)	Mapping Technique Density traces Marginalia Generalization algorithm Mapping tolerance Buffer size	Mapping Technique Minimum Bounding Rectangles
Categorical Aggregation & Overlay (Tesselation, tiling, Areal coverages)	Texture Value (Certainty of boundary location)	Color mixing (Attribute code checks) (Topographic classifier)	lack error models	Mapping Technique Missing values Logical adjacency surface Marginalia Discrete model weights	
Partitioning & Enumeration (Metric class breaks)	not meaningful	Size = height (Blanket of error)	Size = height (Maximum likelihood prism maps)	Mapping Technique Missing values Missclassification matrix Classing scheme OAL/TAI	Marginalia Source of data Scale/Resolution Date Geometry
Continuous Interpolation (Surfaces and volumes)	no clear distinction b/w the two Value Color Saturation (Continuous tone vignettes) (Continuous tone isopleths)		Size = line wt Color Shape = compactness (TIN links)	not possible by definition Mapping Technique Surface of search attenuation Marginalia Interpolation algorithm	

Graphical Syntax ←→ **Graphical/Lexical Syntax**

Figure 2. Buttenfield and Weibel's (1988) initial framework for matching types of uncertainty, kinds of data, and methods of representation. Characterization of representation methods focuses on matching visual variables to kinds of data/uncertainty. Forms of representation are also mentioned, but not systematically addressed (e.g., use of error ellipses, production of prism maps, addition of marginalia). [Modified from a version appearing in Buttenfield (1991); reproduced with author's permission.]

	Field	Image	Thematic	Object
Data or value	Measurement error and precision	Quantization of value in terms of spectral bands and dynamic range	Labeling uncertainty (classification error)	Identity error (incorrect assignment of object type), object definition uncertainty
Space	Locational error and precision	Registration error, sampling precision	Combination effects when data represented by different spatial properties are combined	Object shape error, topological inconsistency, 'split and merge' errors
Time	Temporal error and precision	(Temporal error and precision are usually negligible for image data)	Combination effects when data representing different times are combined	Combination effects when data representing different times are combined
Consistency	Samples / readings collected or measured in an identical manner	Image is captured identically for each pixel, but medium between satellite and ground is not consistent; inconsistent sensing, light falloff; shadows	Classifier strategies are usually consistent in their treatment of a dataset	Methods for object formation may be consistent, but often are not. Depends on extraction strategy
Completeness	Sampling strategy covers space, time and attribute domains adequately	Image is complete, but parts of ground may be obscured	Completeness depends on the classification strategy. (Is all the dataset classified or are only some classes extracted?)	Depends on extraction strategy. Spatial and topological inconsistencies may arise as a result of object formation

Table 1. Types of uncertainty in four models of geographic space (Source: Gahegan and Ehlers, 2000)

Uncertainty review article: MacEachren 2005

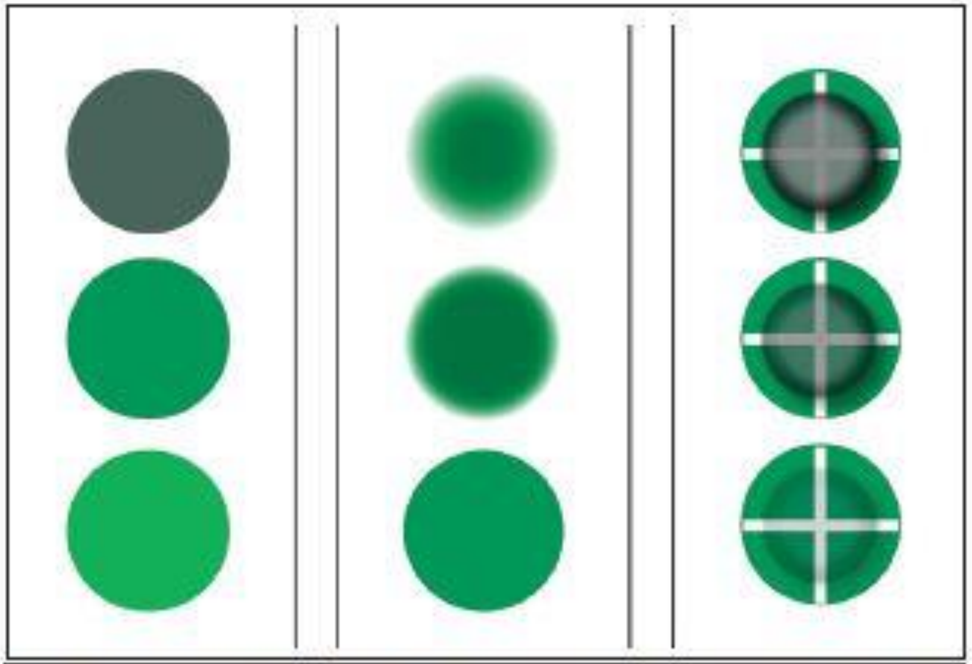


Figure 4. Point symbol sets depicting uncertainty with variation in (a) saturation, i.e., colors vary from saturated green, bottom, to unsaturated—top; (b) crispness of symbol edge—middle; and (c) transparency of symbol—right. In (c), transparency is applied to the smaller symbol in the foreground.

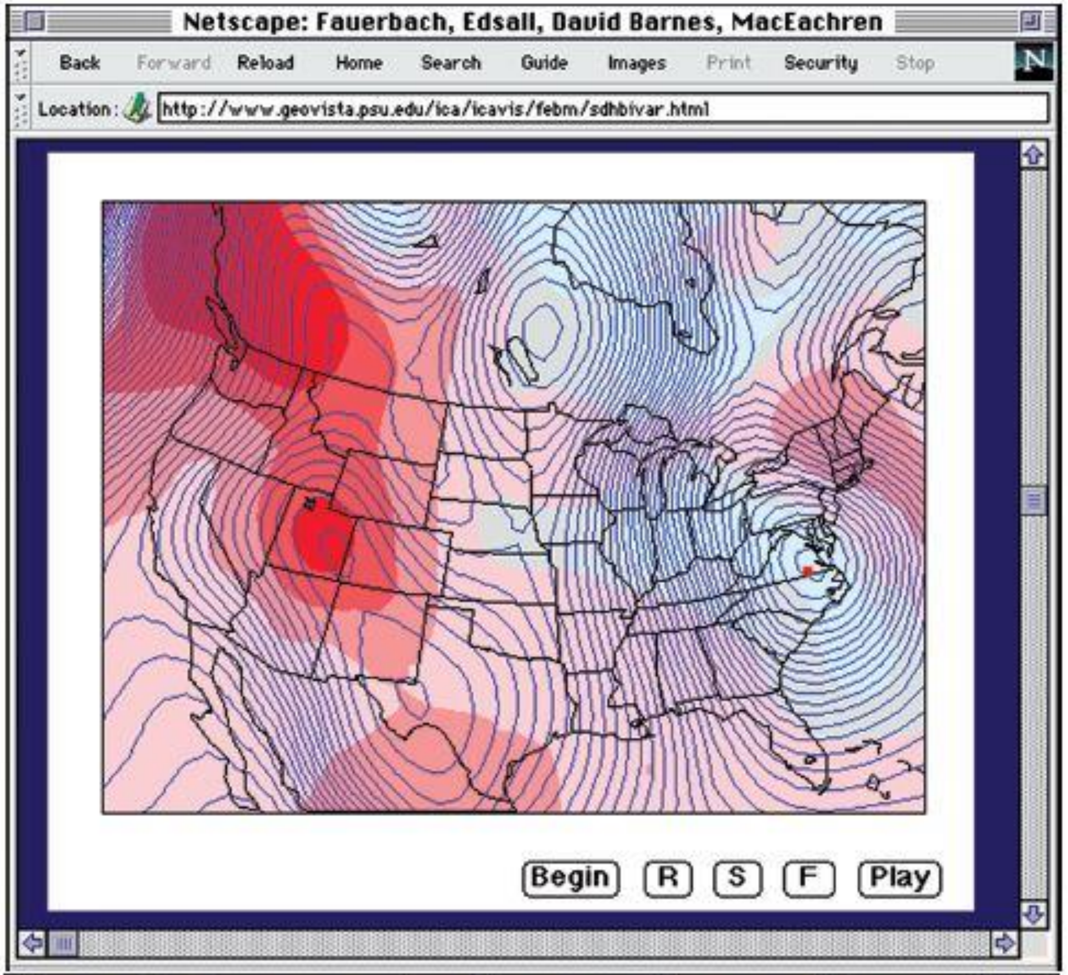


Figure 9. Screen capture from weather model uncertainty animation. [For details, see Fauerbach et al. (1996).]

Cory L. Eicher & Cynthia A. Brewer (2001) Dasymetric Mapping and Areal Interpolation: Implementation and Evaluation, *Cartography and Geographic Information Science*, 28:2, 125-138, DOI: 10.1559/152304001782173727

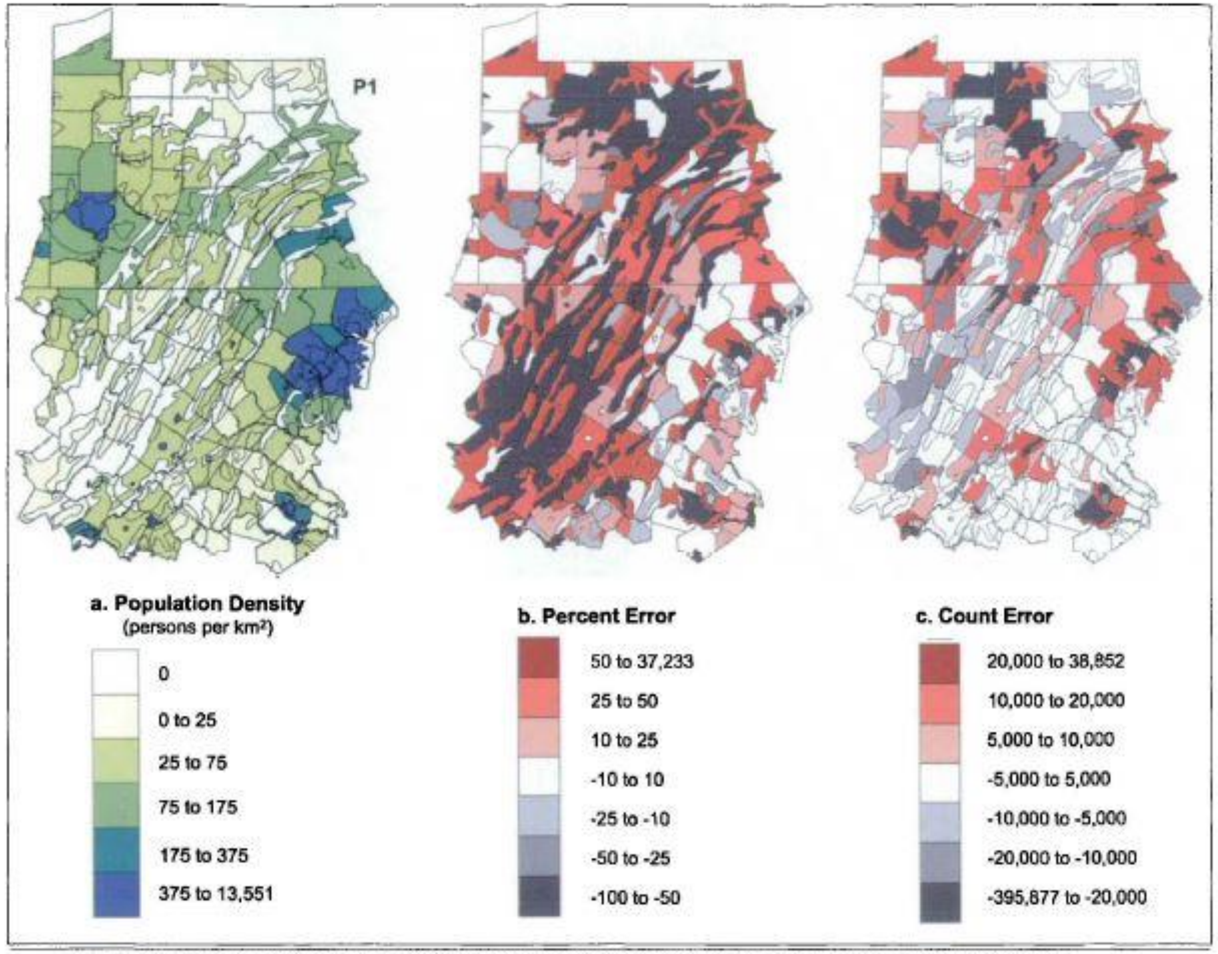


Figure 4. Maps for binary method (P1): a. dasymetric population density map; b. percent error; and c. count error in number of persons.

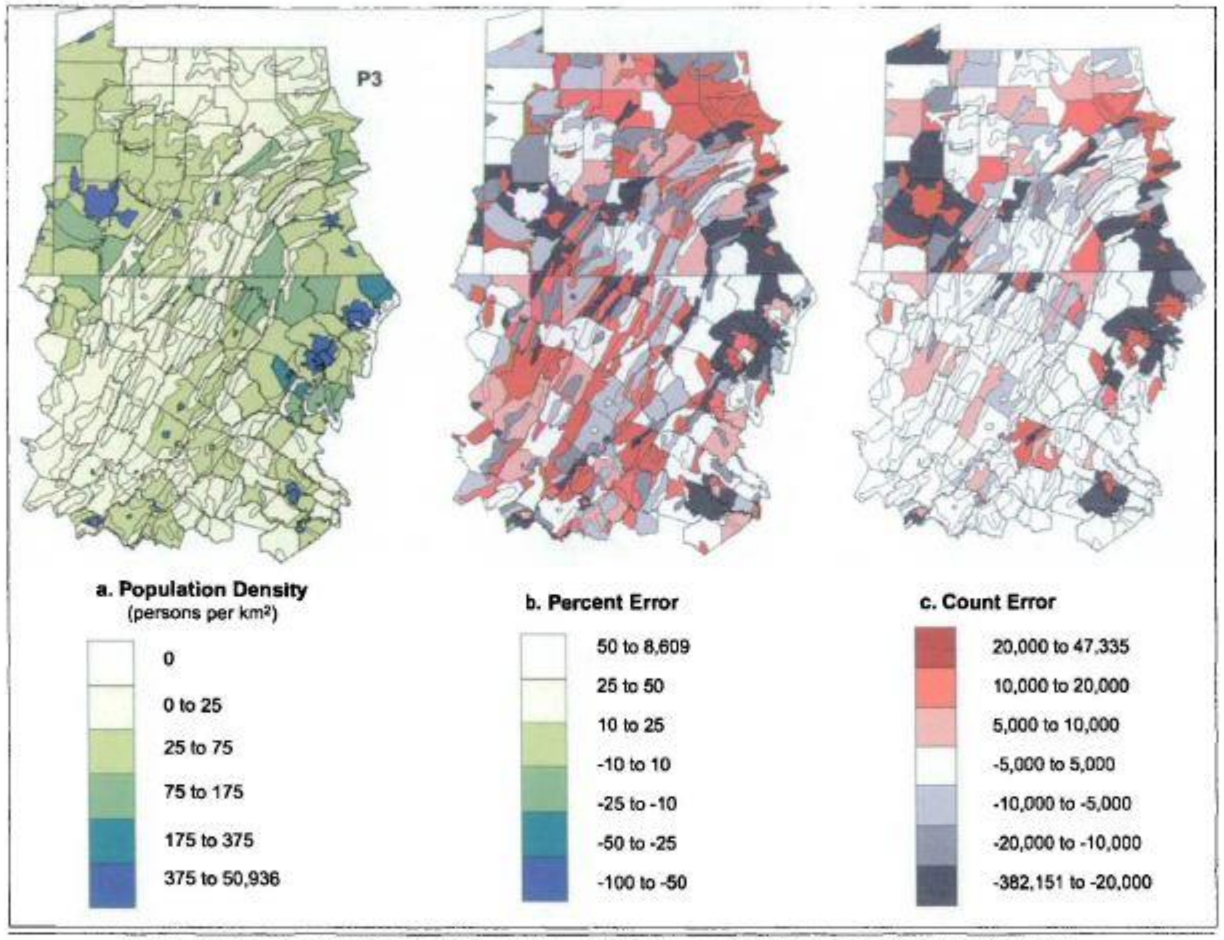


Figure 6. Maps for traditional limiting variable method (P3): a. dasymetric population density map; b. percent error; and c. count error in number of persons.

The Cartographic Journal *Vol. 47 No. 3* *pp. 250–256* *August 2010*

REFEREED PAPER

The Potential of the Lenticular Foil Technique for Thematic Cartography

Frank Dickmann

Department of Geography, Ruhr University Bochum, Germany
Email: frank.dickmann@rub.de

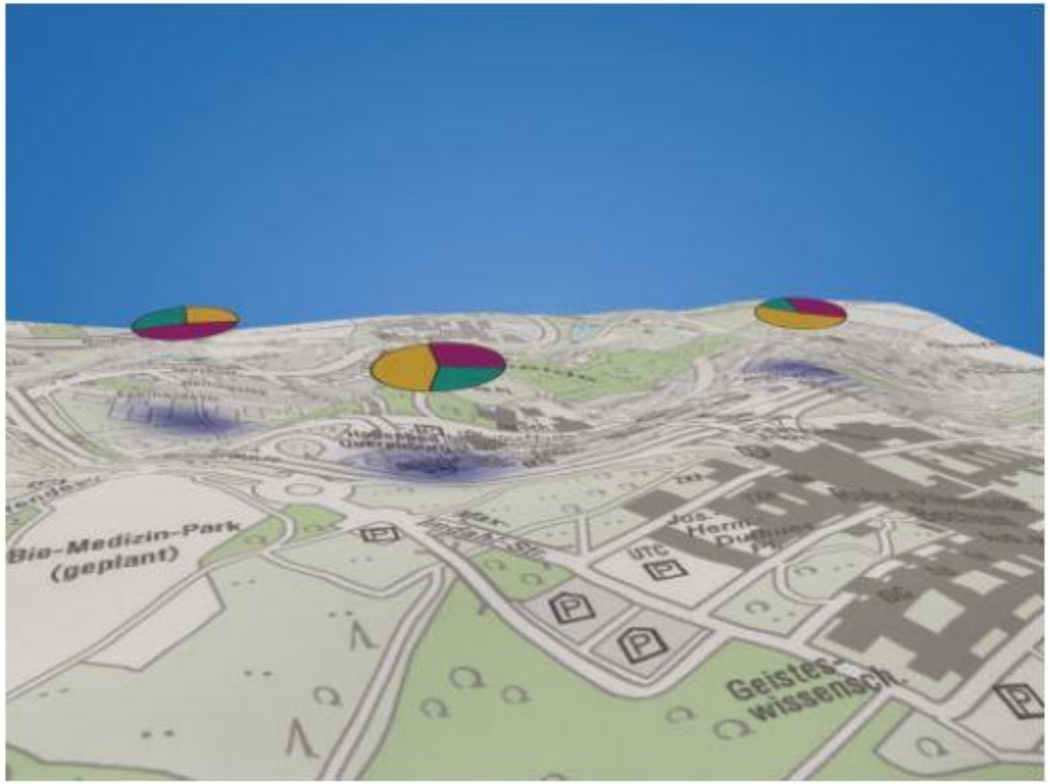


Figure 5. Combination of a thematic map with 3D relief information (simulated representation)

New variants on flow maps

2536 IEEE TRANSACTIONS ON VISUALIZATION AND COMPUTER GRAPHICS, VOL. 17, NO. 12, DECEMBER 2011

Flow Map Layout via Spiral Trees

Kevin Verbeek, Kevin Buchin, and Bettina Speckmann

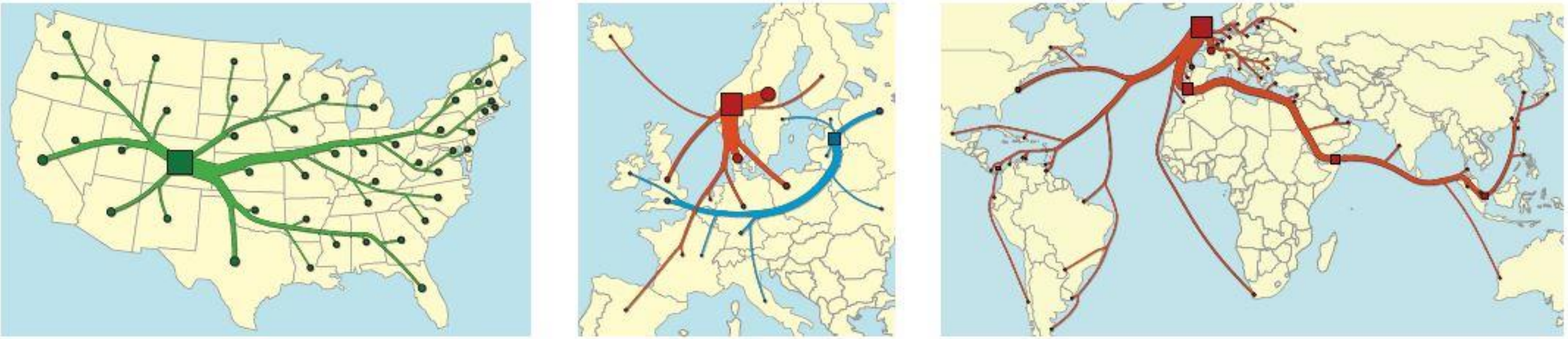


Fig. 1. Flow maps: Migration from Colorado, migration from Norway and Latvia, whisky exports from Scotland.

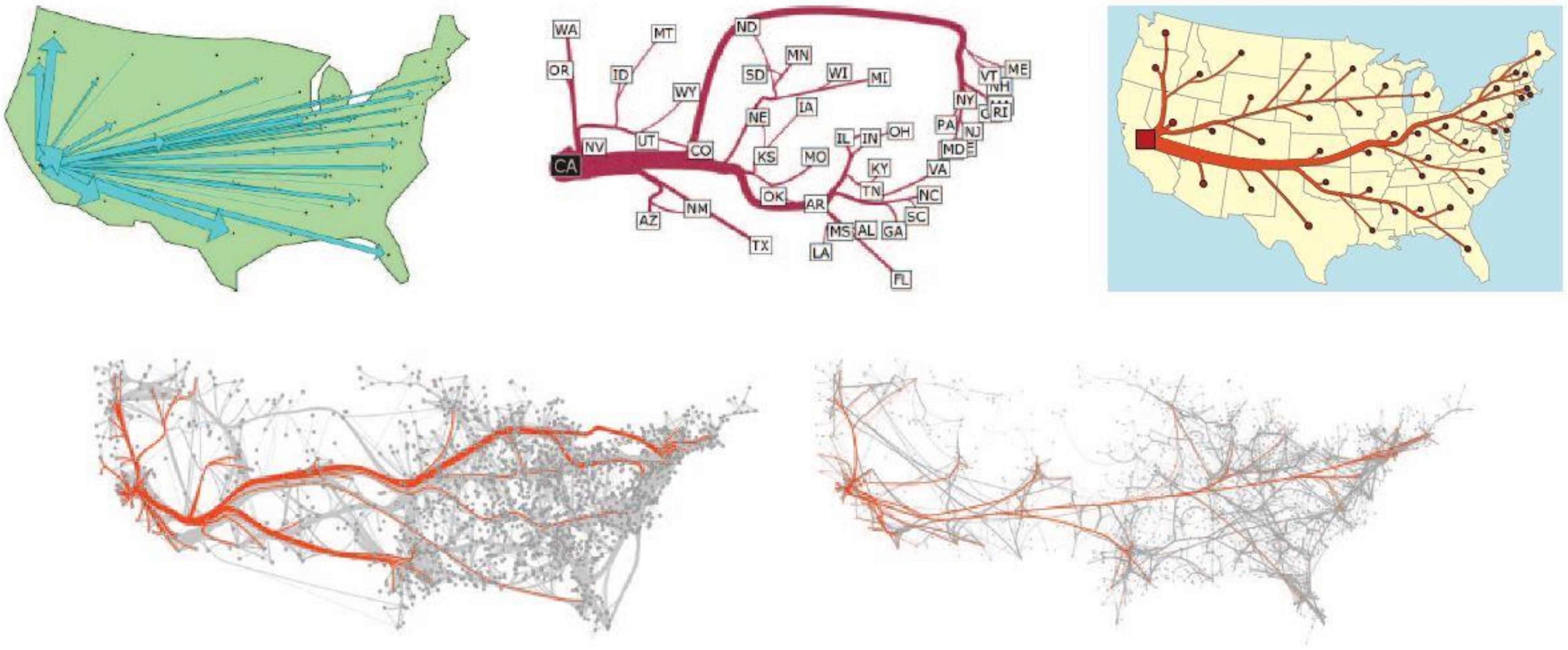


Fig. 2. Maps illustrating migration from California 1995–2000. Top: flow maps, Tobler [1, 22] (arrows of varying width), Phan *et al.* [16] (edge-bundeling with crossings), and our output. Bottom: subgraphs of the bundled complete migration graph, Cui *et al.* [5] and Holten & van Wijk [11].

Fig. 9. Flow map illustrating migration from Texas 1995–2000 after computing the spiral tree (left), subdividing and thickening the edges (middle), and finally minimizing the cost function (right).

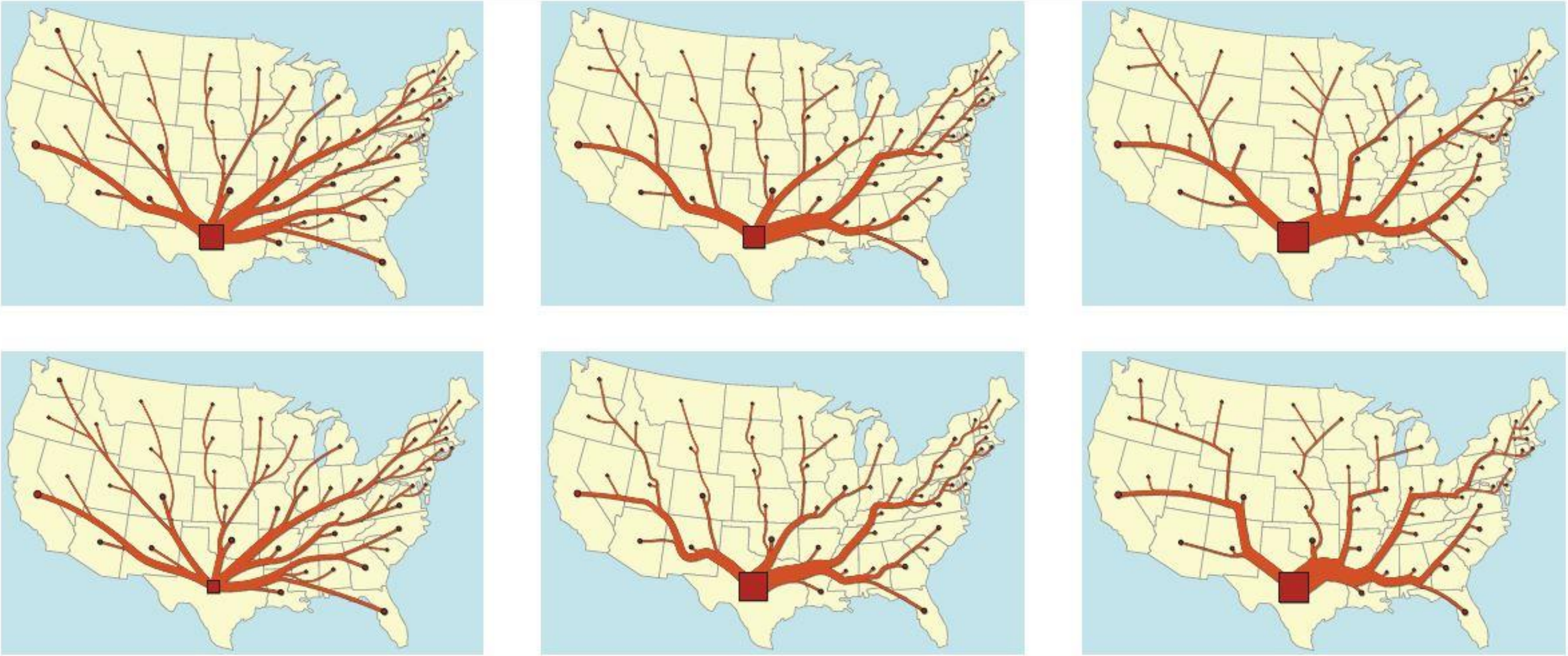


Fig. 11. Various results of our algorithm. We use $\alpha = 15°$ (left), $\alpha = 25°$ (middle), and $\alpha = 35°$ (right). The top figures use standard parameters. For the bottom figures, we increased buffer size B by a factor of 1.5 (left), set $c_S = 0$ (middle), and set $c_{str} = 0$ (right).

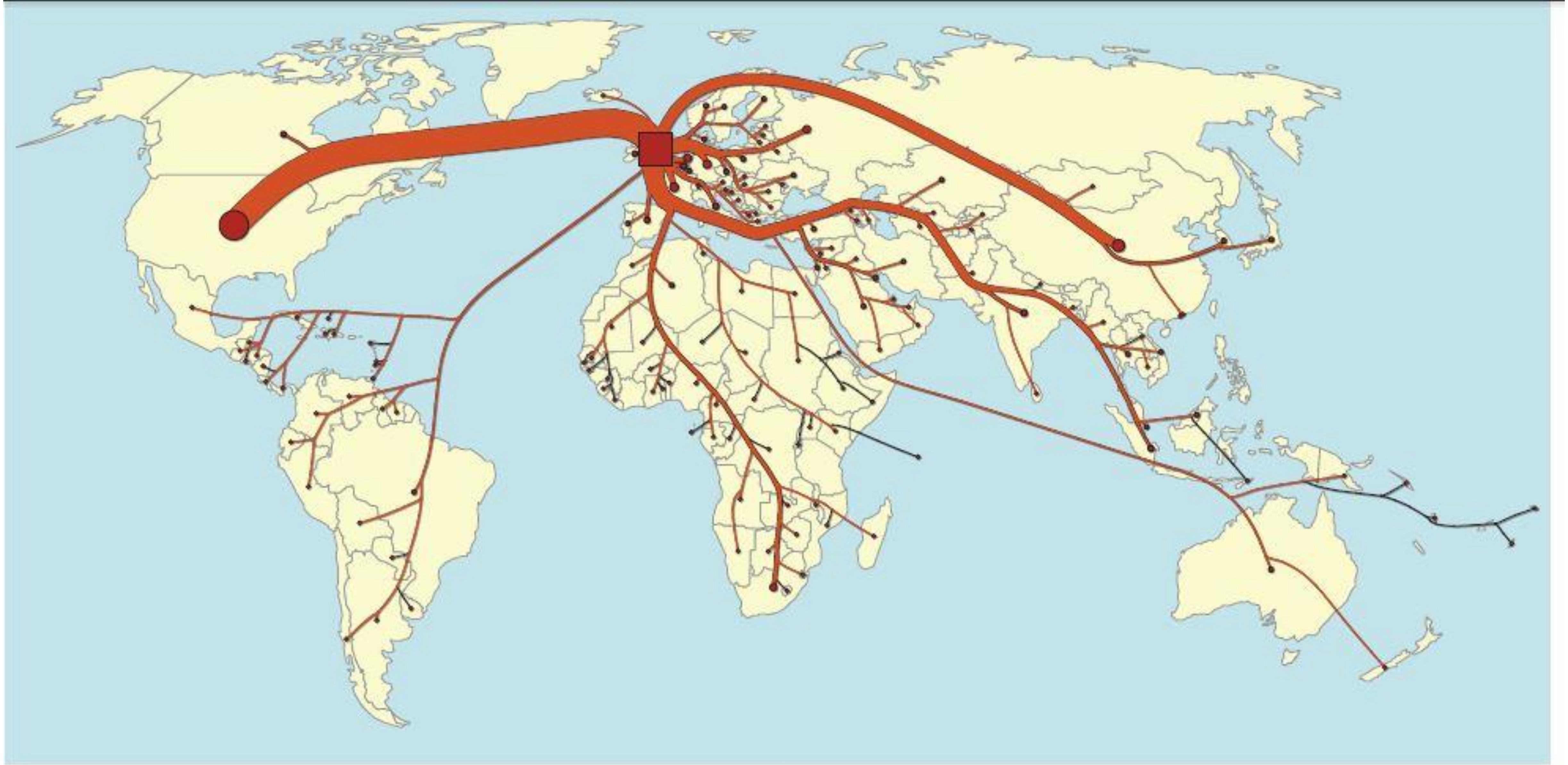


Fig. 14. Flow of embodied CO_2 to the United Kingdom. Embodied CO_2 refers to the entire amount of CO_2 emitted for the production and transportation of goods to consumers. The map shows the CO_2 flows into the United Kingdom from each of its trading partners. CO_2 emissions from transportation are shown as originating from the country that provides the transportation fuel. The embodied CO_2 flows in this map have been calculated using the Eora MRIO Model being built at the University of Sydney.

Spatialization

Spatialization Methods: A Cartographic Research Agenda for Non-geographic Information Visualization

André Skupin and Sara Irina Fabrikant

ABSTRACT: Information visualization is an interdisciplinary research area in which cartographic efforts have mostly addressed the handling of geographic information. Some cartographers have recently become involved in attempts to extend geographic principles and cartographic techniques to the visualization of non-geographic information. This paper reports on current progress and future opportunities in this emerging research field commonly known as spatialization. The discussion is mainly devoted to the computational techniques that turn high-dimensional data into visualizations via processes of projection and transformation. It is argued that cartographically informed engagement of computationally intensive techniques can help to provide richer and less opaque information visualizations. The discussion of spatialization methods is linked to another priority area of cartographic involvement, the development of theory and principles for cognitively plausible spatialization. The paper distinguishes two equally important sets of challenges for cartographic success in spatialization research. One is the recognition that there are distinct advantages to applying a cartographic perspective in information visualization. This requires our community to more thoroughly understand the essence of cartographic activity and to explore the implications of its metaphoric transfer to non-geographic domains. Another challenge lies in cartographers becoming a more integral part of the information visualization community and actively engaging its constituent research fields.

KEYWORDS: Visualization, spatialization, cartography, dimensionality, self-organizing maps, multidimensional scaling, spatial cognition, human-computer interaction

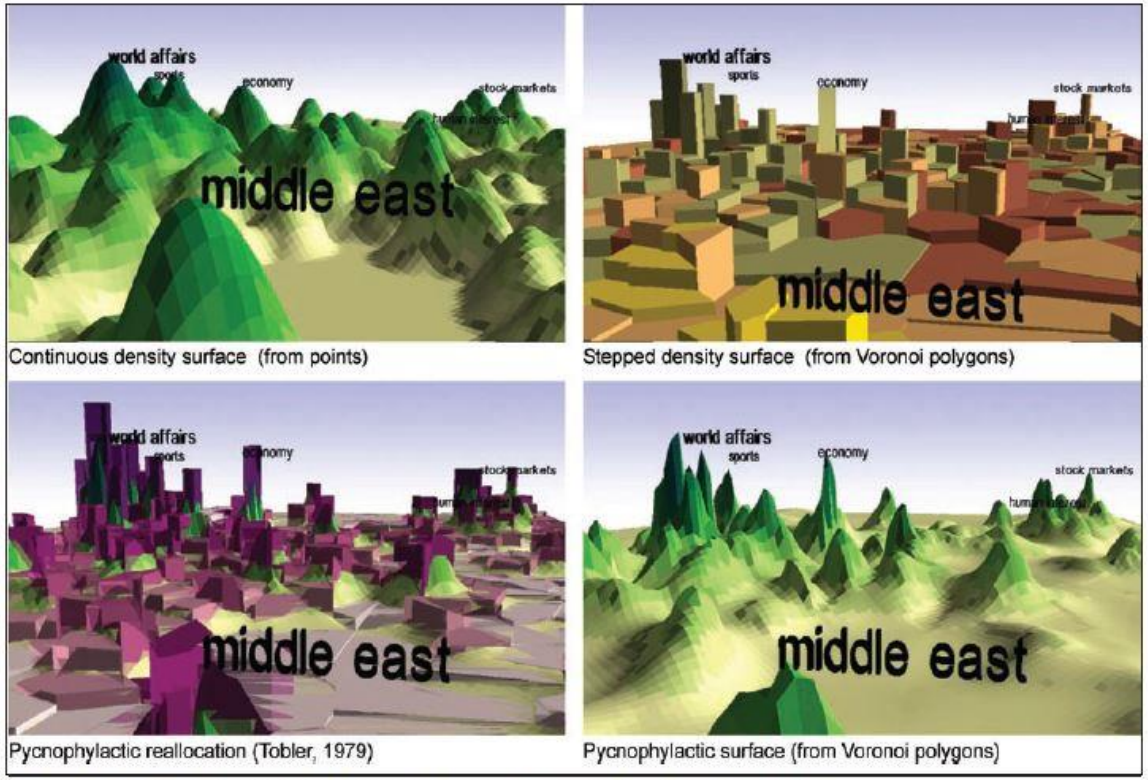


Figure 12. Density surfaces derived from a single, two-dimensional, spring configuration.

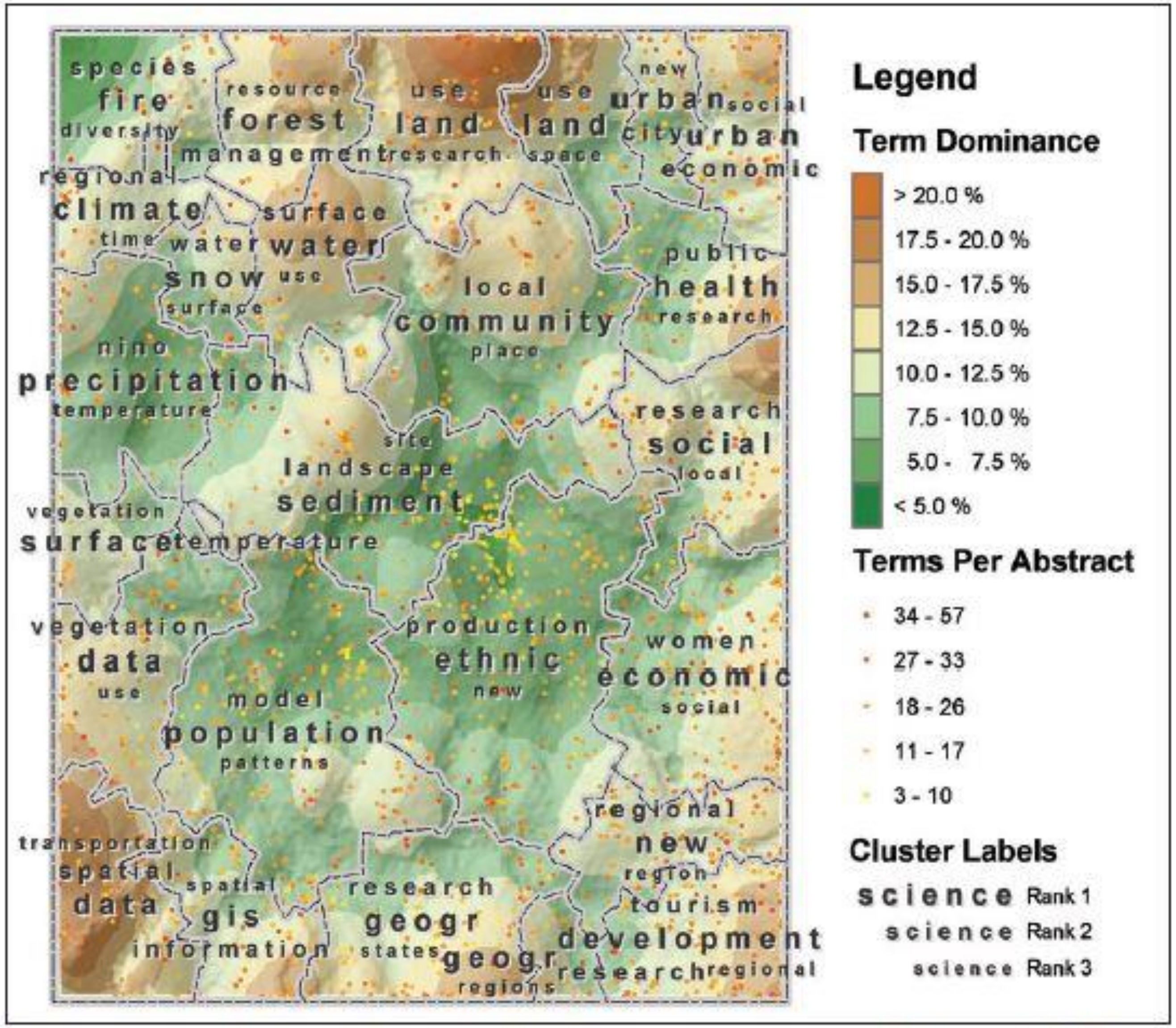


Figure 16. Visual support for evaluating cluster validity. The visualization is based on a 60-by-80 neuron SOM. It shows individual point locations for several thousand AAG conference abstracts, the 25-cluster level of a hierarchical cluster solution, ranked cluster labels, and an indication of how much the highest-ranked terms dominate particular regions. Low term dominance may indicate a lack of sharply defined themes and therefore the existence of relatively heterogeneous clusters.

Current “hot” research

- Mapping social media data
- Human terrain and geography
- Visualization of space-time and trajectories
- Visual analytics, information graphics, geovisualization and spatialization
- Uncertainty
- Showing results from models as globes, animations, etc
- Web mapping with new attributes and methods
- 3D visualization and interior space mapping

Pingel, P. J., Clarke, K. & Ford, A. (2015) Bonemapping: a LiDAR processing and visualization technique in support of archaeology under the canopy, *Cartography and Geographic Information Science*, 42:sup1, 18-26, DOI: 10.1080/15230406.2015.1059171

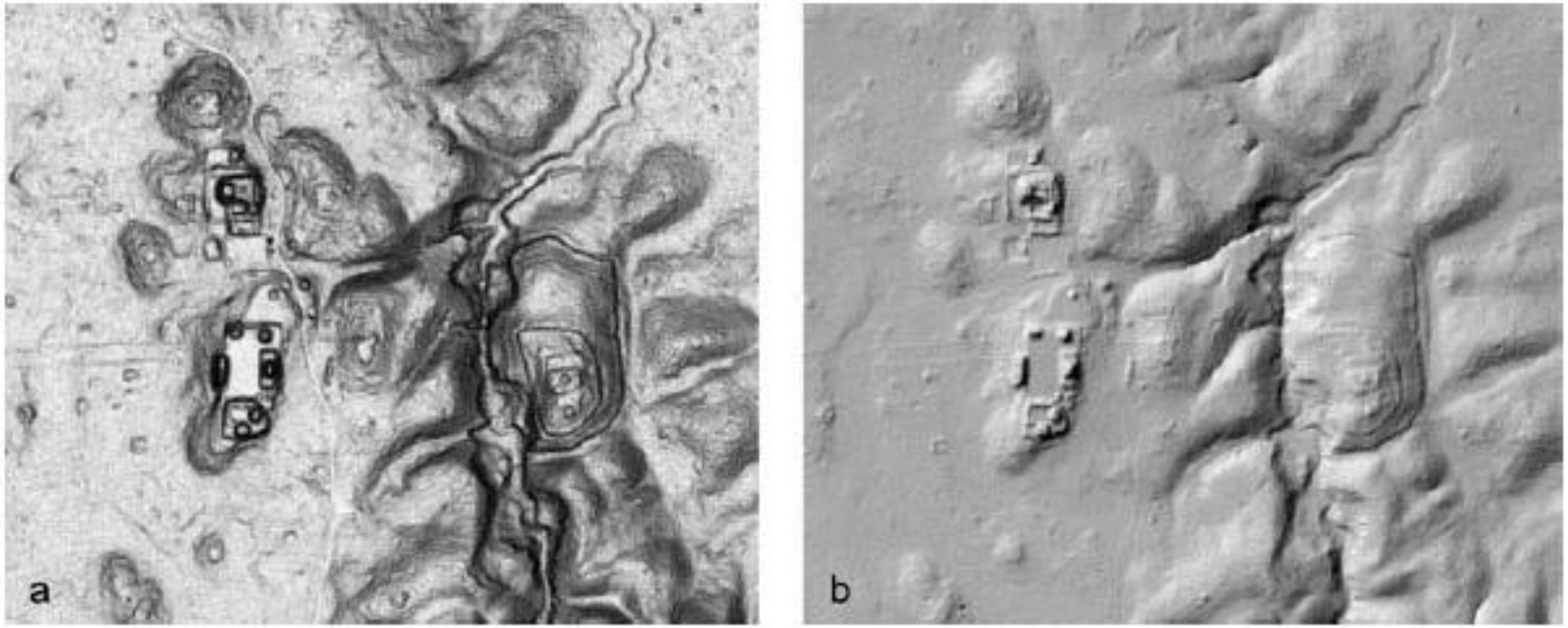


Figure 3. Comparison between (a) a bonemap visualization of the central site of El Pilar and (b) a Terrascan-produced DTM visualized with shaded relief.

Han, S.Y., Tsou, M-H and Clarke K.C. (2015) Do Global Cities Enable Global Views? Using Twitter to Quantify the Level of Geographical Awareness of U. S. Cities. *PLoS ONE* 10(7): e0132464. doi:10.1371/journal.pone.0132464

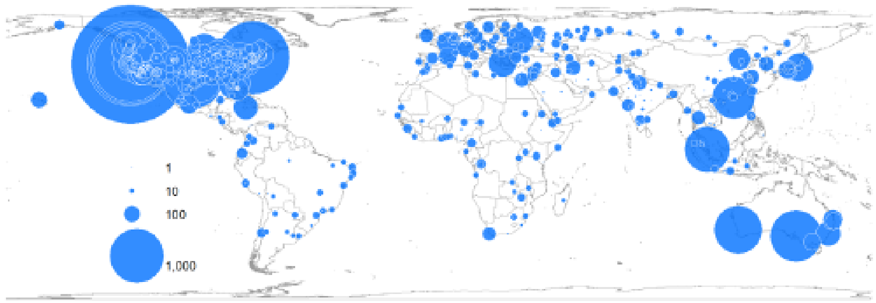


Fig 4. Geographical awareness of Twitter users in San Jose, CA. The size of the circle is proportional to the number of city names mentioned in tweets. Twitter users in San Jose, CA mentioned city names 53,625 times from Dec 2013 to Feb 2014. Among them, the users mentioned San Jose 14,272 times, which is 27% of all the city names mentioned in the tweets. The city name, San Jose, was excluded in this map. The top three most mentioned city names were San Jose, CA, Sunnyvale, CA and San Francisco, CA. This map was created using tweets collected from San Jose, CA during the collection of dataset 1 in Table 1(S2 Table).

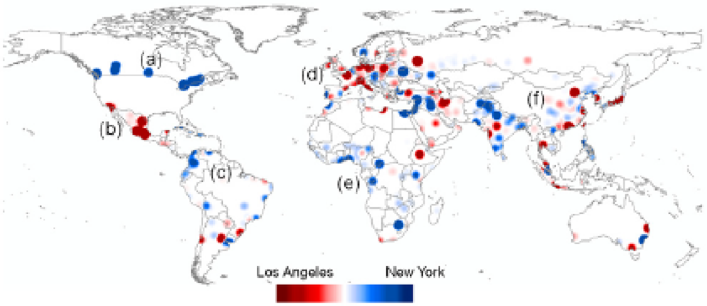


Fig 8. The awareness of global cities between Twitter users in New York (NY) versus Los Angeles (LA). The geographical awareness of each group was estimated based on the names of international cities mentioned in their tweets. The map shows the difference in the distributional patterns of the geographical awareness between the two groups. The users in LA are more aware of the red regions than those in NY. The users in NY are more aware of the blue regions than those in LA. This map was created by using tweets collected from LA and NY during the collection of dataset 1 in Table 1 (S4 and S5 Tables). Tweets inside the U.S. are excluded to map.

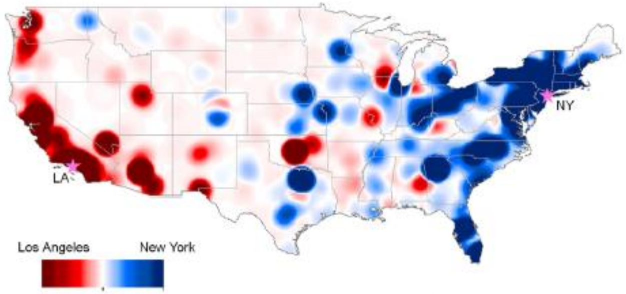


Fig 10. The awareness of U.S. cities between Twitter users in New York (NY) versus Los Angeles (LA). The geographical awareness of each group was estimated based on the names of U.S. cities mentioned in their tweets. The map shows the difference in the distributional patterns of the geographical awareness between the two groups. The users in LA are more aware of the red regions (mostly the western U.S.) than those in NY. The users in NY are more aware of the blue regions (mostly the eastern U.S.) than those in LA. This map was created by using tweets collected from LA and NY during the collection of dataset 2 in Table 1 (S6 and S7 Tables).

Ourania Kounadi, Alina Ristea, Michael Leitner & Chad Langford (2018) Population at risk: using areal interpolation and Twitter messages to create population models for burglaries and robberies, *Cartography and Geographic Information Science*, 45:3, 205-220, DOI:10.1080/15230406.2017.1304243

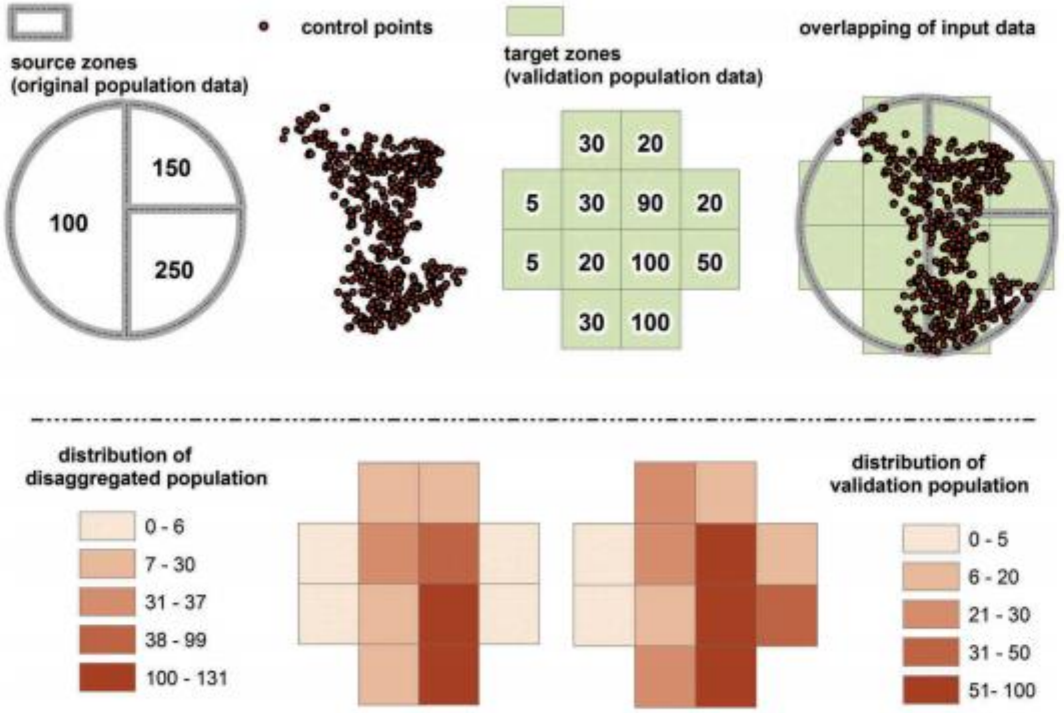


Figure 1. An example of the density weighted areal interpolation technique depicting the three input data (i.e. source zones, control points, and target zones), the output disaggregated model (i.e. distribution of disaggregated population), and if it is available, the distribution of the validation data (i.e. distribution of validation population).

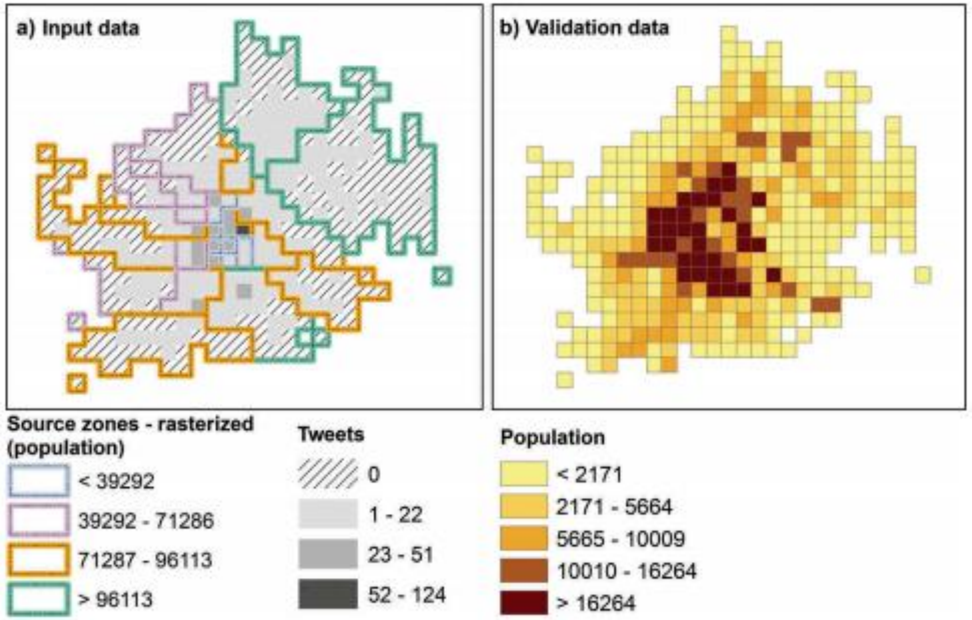


Figure 3. Input data: (a) rasterized source zones overlapping with counts of tweets per cell (tweets collected during workday sleeping hours), and (b) validation population data.

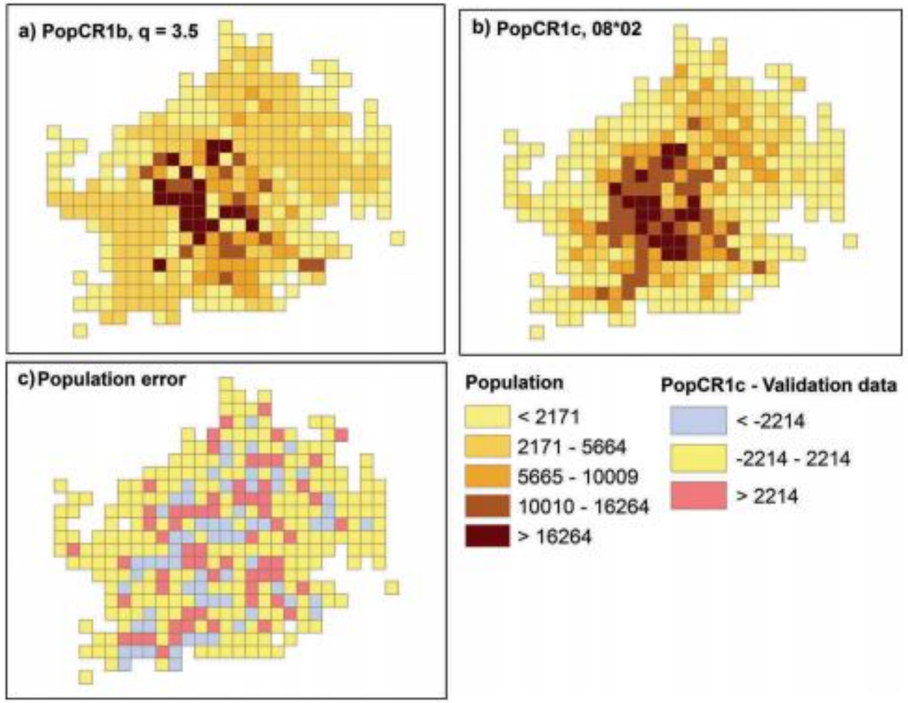


Figure 5. PopCR1b and 1c models: (a) best PopCR1b model, (b) best PopCR1c model, and (c) population difference between the PopCR1c and validation data.

Comparison

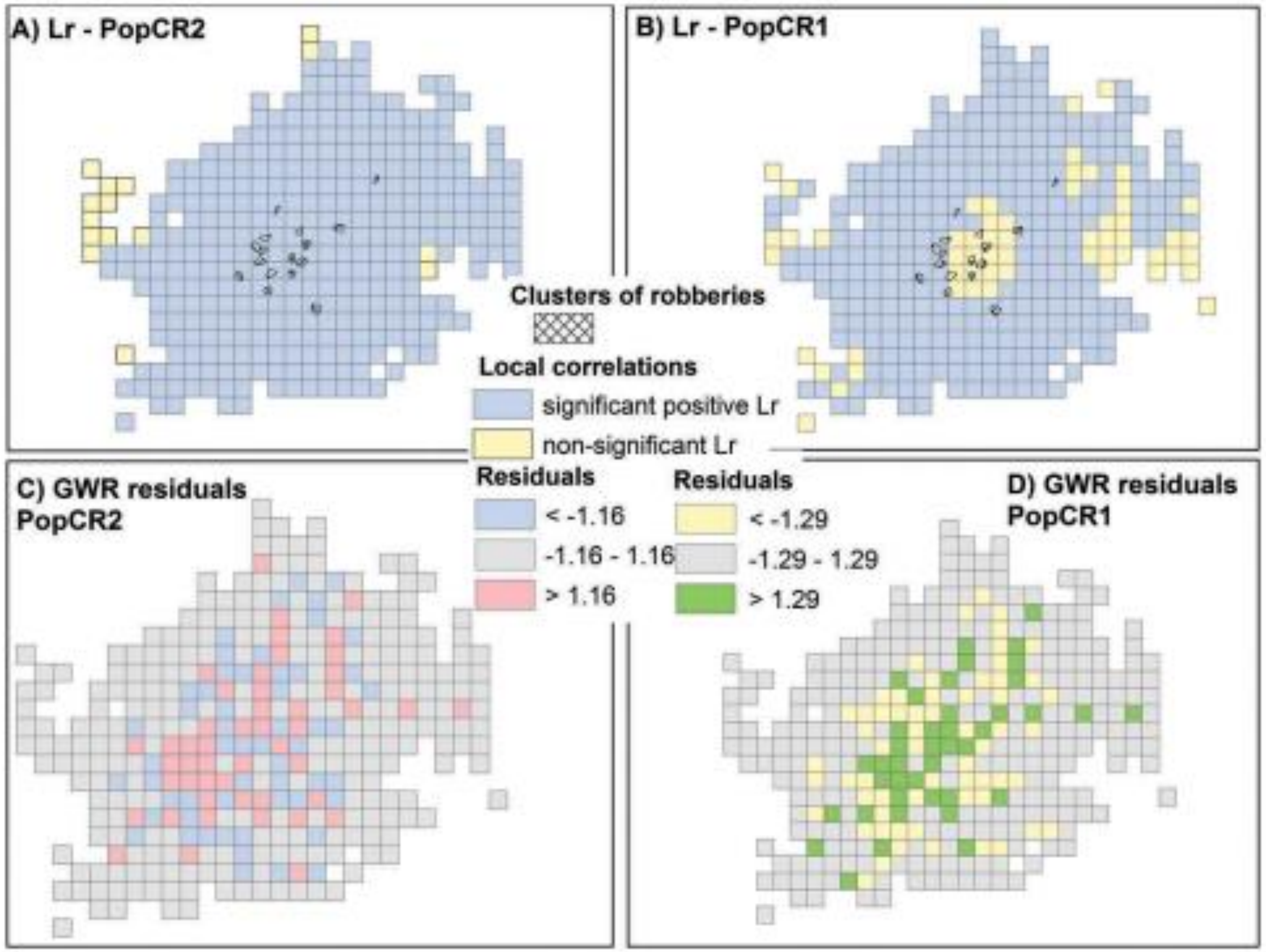


Figure 7. Statistical comparison of PopCR1 and PopCR2 (*best models*): (a) Significant local correlations of PopCR2 with robberies, (b) significant local correlations of PopCR1 with robberies, (c) geographically weighted regression residuals between PopCR2 and robberies, (d) geographically weighted regression residuals between PopCR1 and robberies.

Ian J. Irmischer & Keith C. Clarke (2017): Measuring and modeling the speed of human navigation, *Cartography and Geographic Information Science*
dx.doi.org/10.1080/15230406.2017.1292150

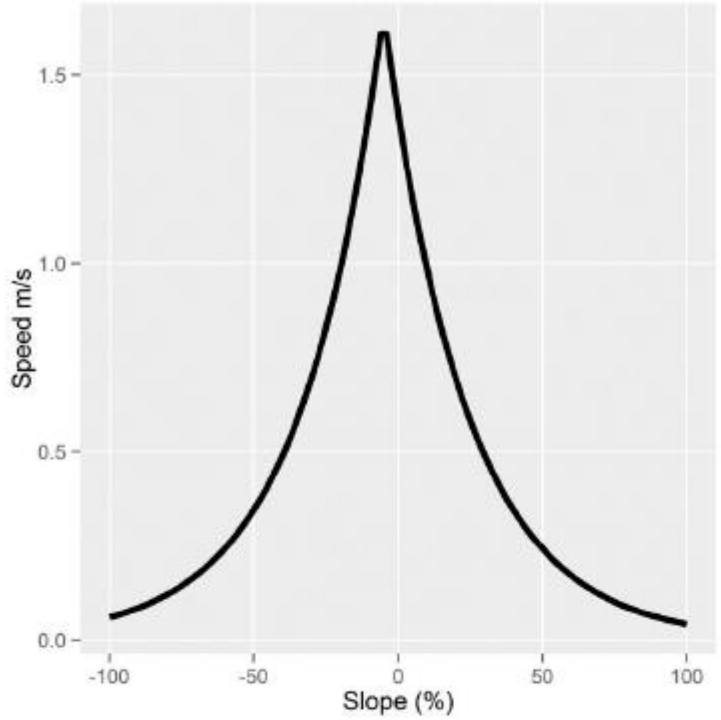


Figure 1. Tobler's hiking function.

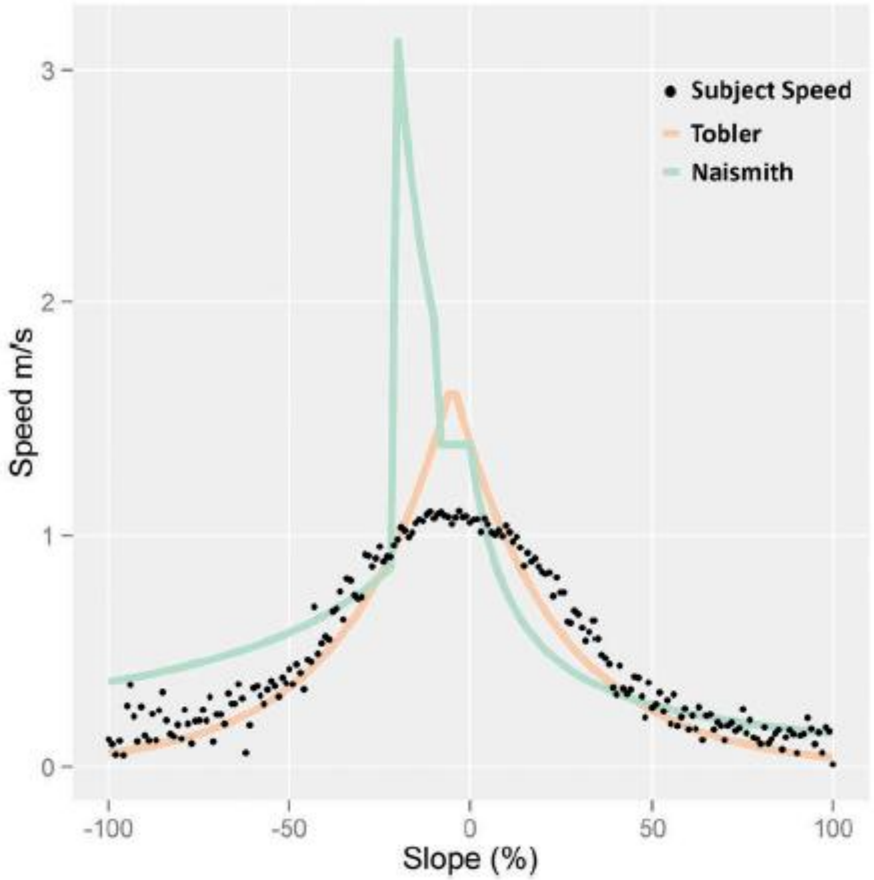


Figure 4. On-road speed of navigation – males.

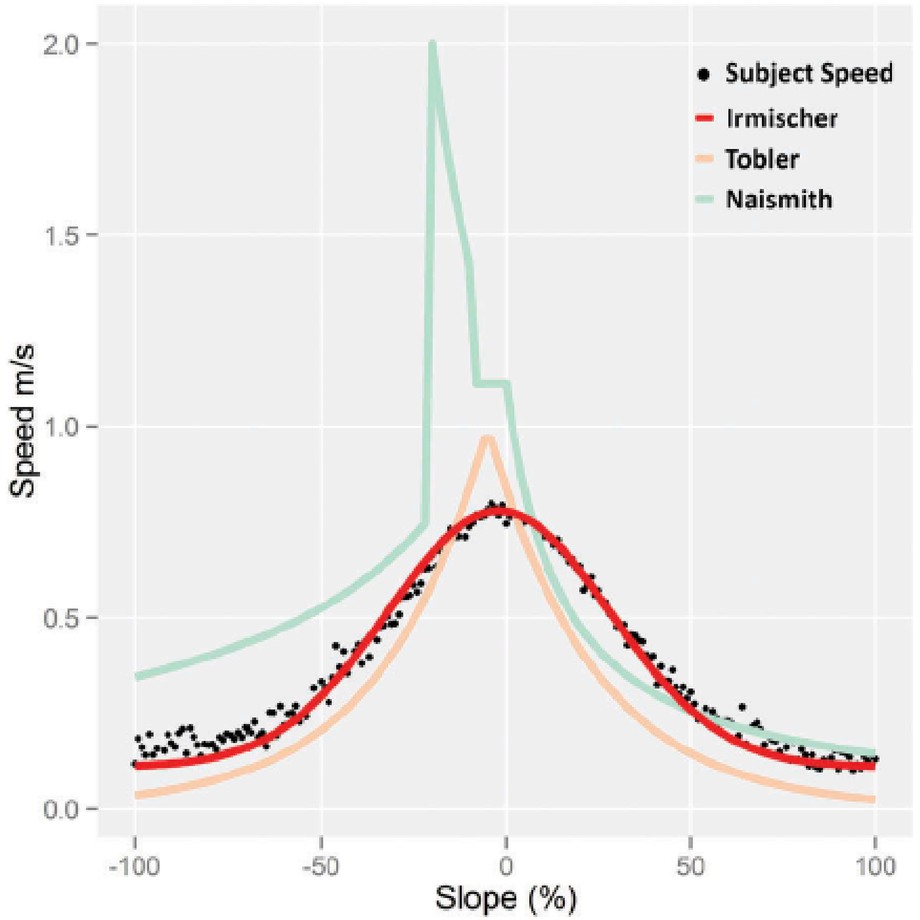


Figure 10. Irmischer model of off-road navigation speed – males.

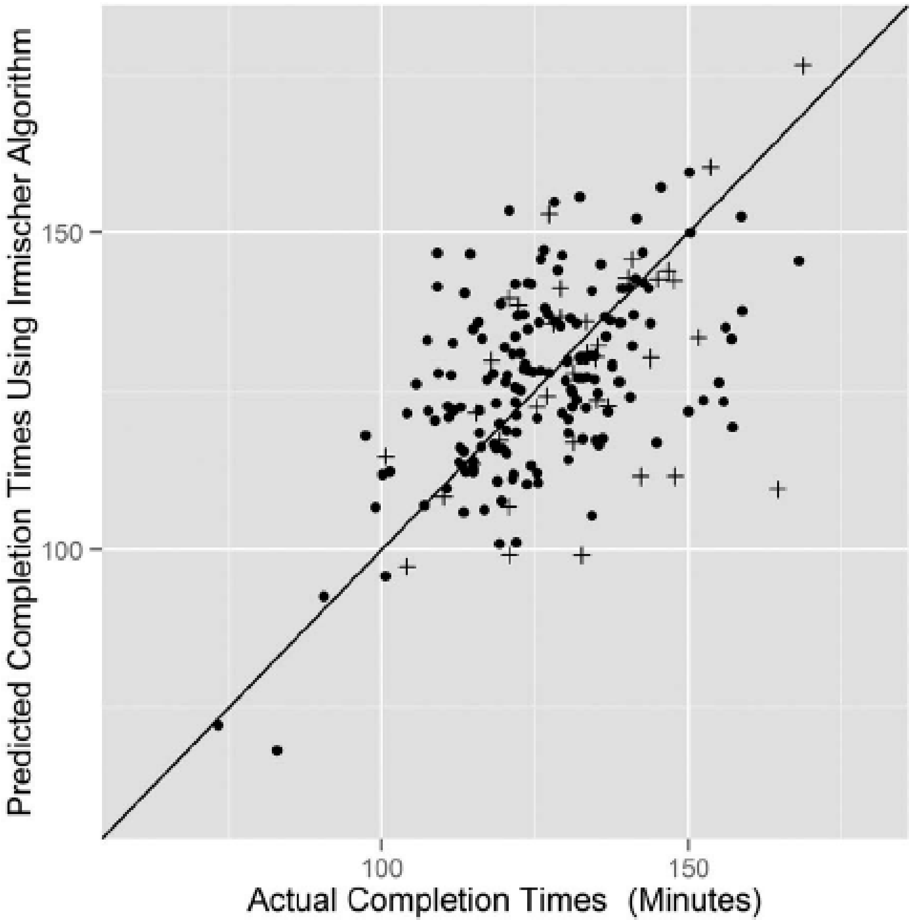


Figure 12. Comparison of predicted vs. actual completion times using the Irmischer algorithm.

Hiking function from data

(equation 3). The models reduce movement speeds by 5% for females (as shown by the .95 scaling factor present in equations 3 and 5). Off-road movement equations for males and females are shown as equations 4 and 5, respectively. The results of the curve fitting are shown in Figures 8–11.

$$Speed(m/s) = 0.11 + e^{\frac{-(Slope + 5)^2}{2*30^2}} \quad (2)$$

$$Speed = .95*\left(0.11+e^{\frac{-(Slope + 5)^2}{2*30^2}}\right) \quad (3)$$

$$Speed = 0.11 + .67*e^{\frac{-(Slope + 2)^2}{2*30^2}} \quad (4)$$

$$Speed = .95*\left(0.11 + .67*e^{\frac{-(Slope + 2)^2}{2*30^2}}\right), \quad (5)$$

$$\text{where: } Slope = \frac{\Delta \text{ elevation}}{\Delta \text{ distance}} * 100$$

Visual inspection of the figures indicates that the equations predict the bin means rather successfully. Figures 9 and 11 show more variability than Figures 8 and 10, especially at extreme slopes, due to significantly

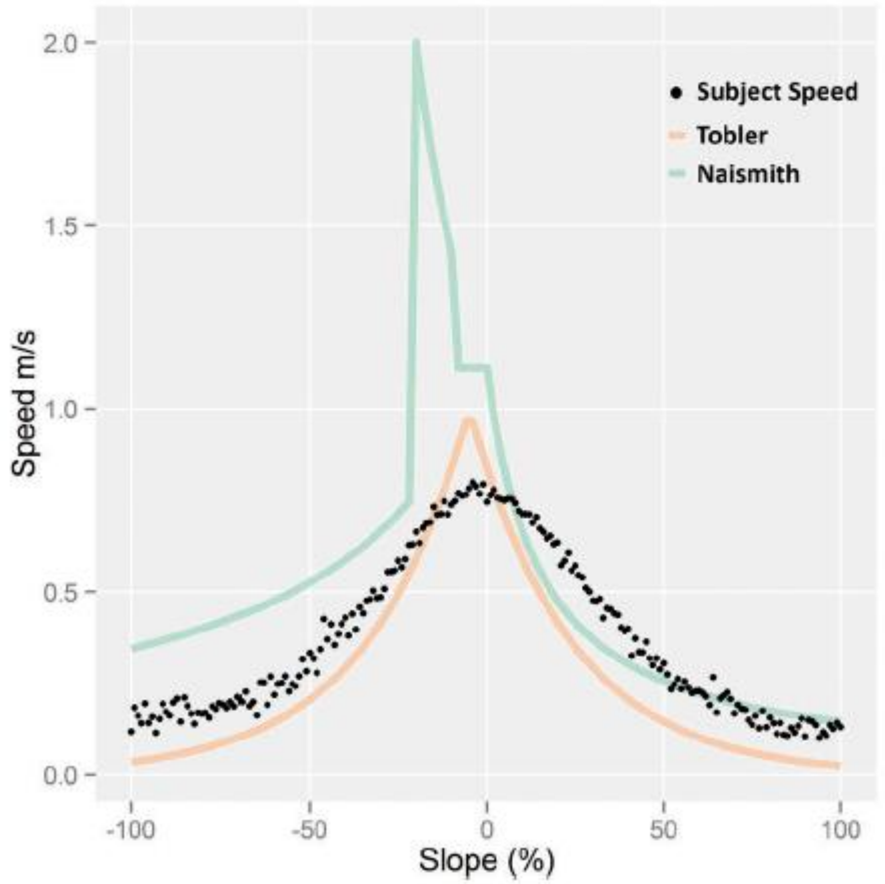


Figure 6. Off-road speed of navigation – males.

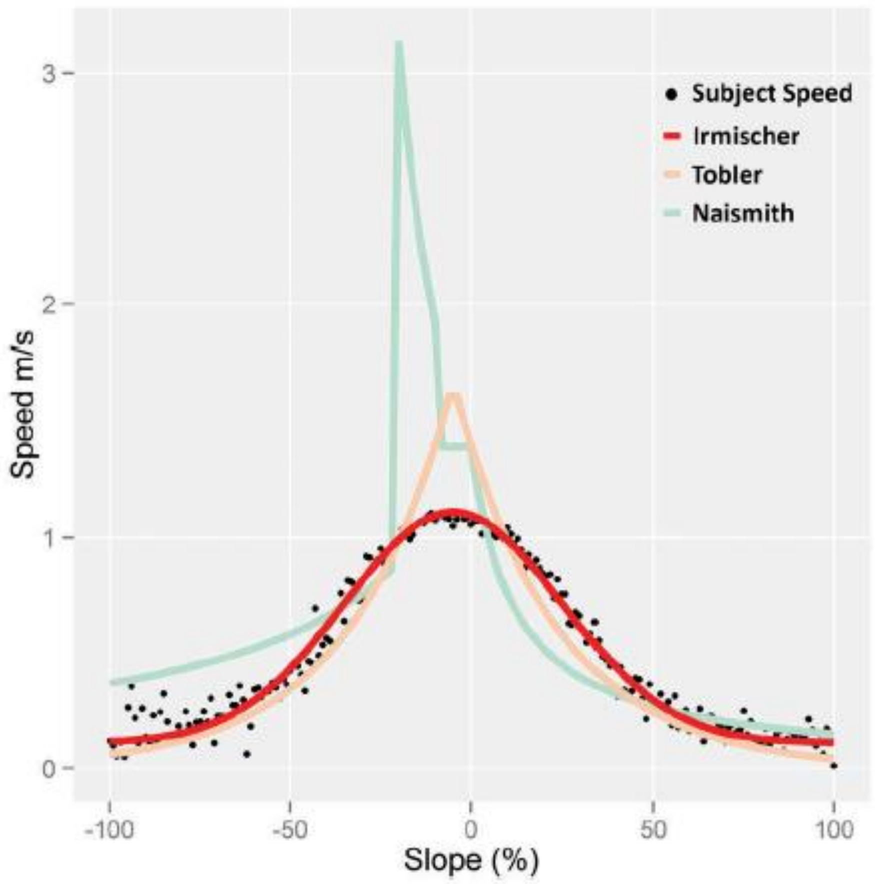
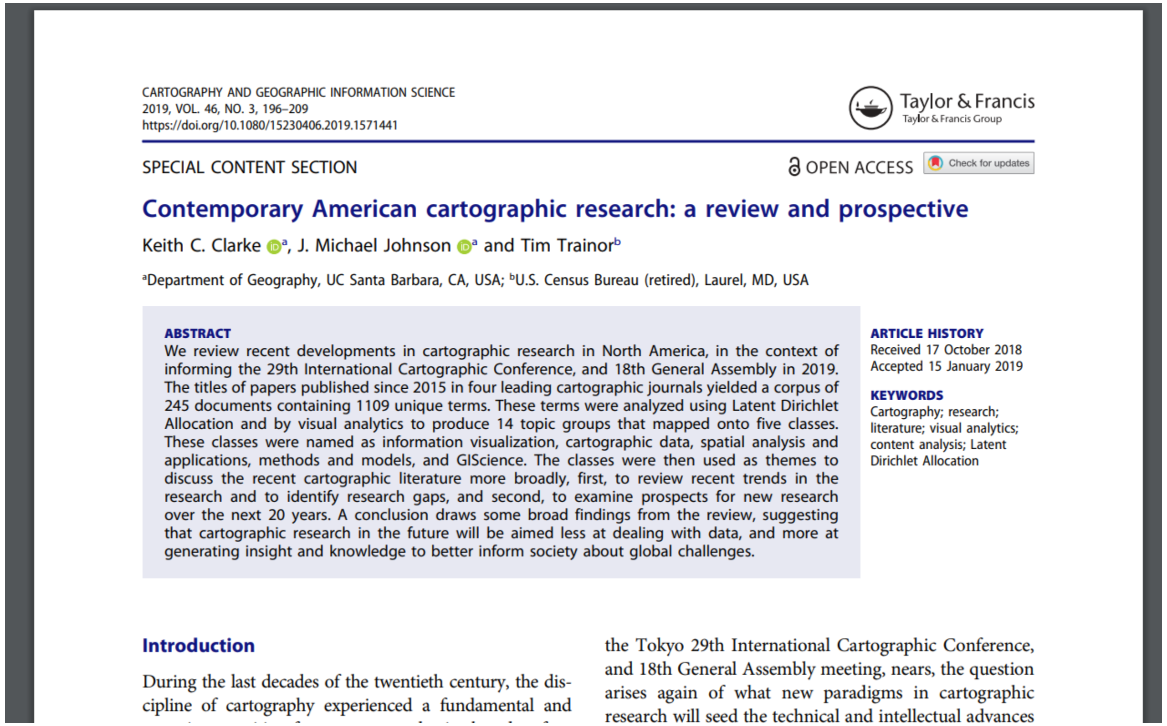


Figure 8. Irmischer model of on-road navigation speed – males.

Cartographic Research in 2019

- Keith C. Clarke, J. Michael Johnson & Tim Trainor (2019) Contemporary. American cartographic research: a review and prospective, *Cartography and Geographic Information Science*, 46:3, 196-209, DOI: 10.1080/15230406.2019.1571441



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2019, VOL. 46, NO. 3, 196–209
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SPECIAL CONTENT SECTION

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Contemporary American cartographic research: a review and prospective

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ABSTRACT
We review recent developments in cartographic research in North America, in the context of informing the 29th International Cartographic Conference, and 18th General Assembly in 2019. The titles of papers published since 2015 in four leading cartographic journals yielded a corpus of 245 documents containing 1109 unique terms. These terms were analyzed using Latent Dirichlet Allocation and by visual analytics to produce 14 topic groups that mapped onto five classes. These classes were named as information visualization, cartographic data, spatial analysis and applications, methods and models, and GIScience. The classes were then used as themes to discuss the recent cartographic literature more broadly, first, to review recent trends in the research and to identify research gaps, and second, to examine prospects for new research over the next 20 years. A conclusion draws some broad findings from the review, suggesting that cartographic research in the future will be aimed less at dealing with data, and more at generating insight and knowledge to better inform society about global challenges.

ARTICLE HISTORY
Received 17 October 2018
Accepted 15 January 2019

KEYWORDS
Cartography; research; literature; visual analytics; content analysis; Latent Dirichlet Allocation

Introduction

During the last decades of the twentieth century, the discipline of cartography experienced a fundamental and

the Tokyo 29th International Cartographic Conference, and 18th General Assembly meeting, nears, the question arises again of what new paradigms in cartographic research will seed the technical and intellectual advances

The titles of papers published since 2015 in four leading cartographic journals yielded a corpus of 245 documents containing 1109 unique terms.

Figure 1. Word cloud of terms included in 245 cartographic research paper titles 2015–2018.

Themes extracted by Latent Dirichlet Allocation

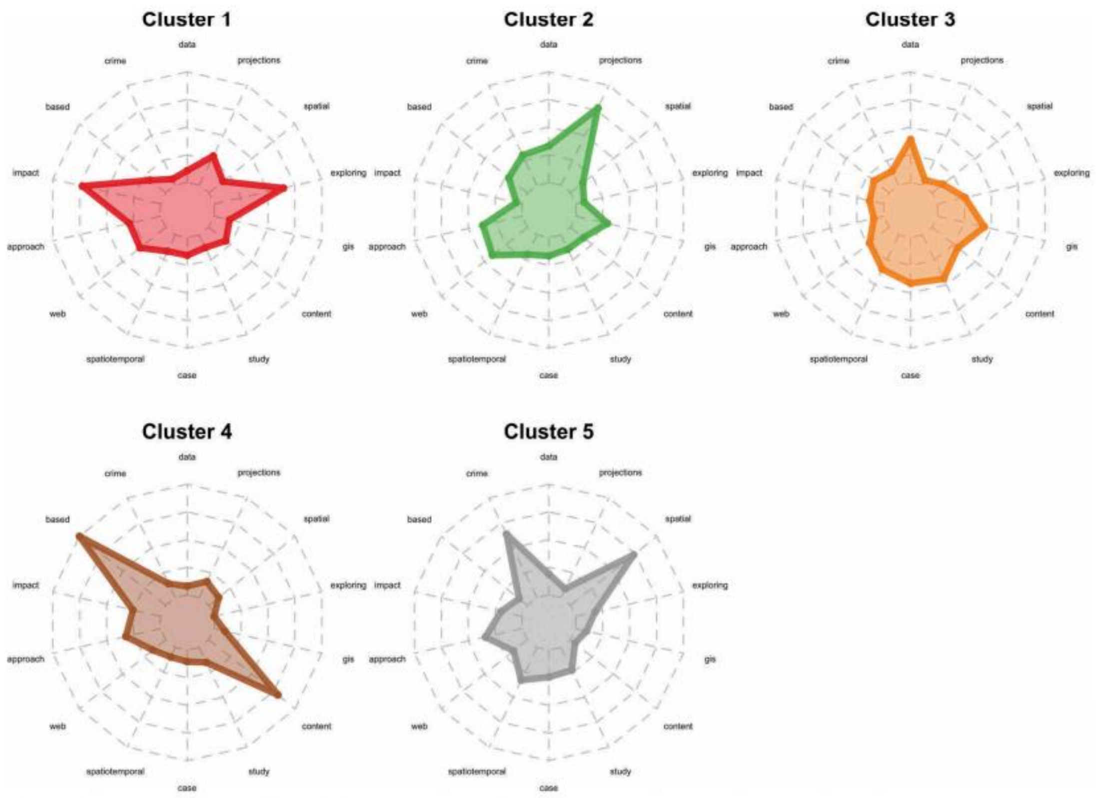

Figure 2. Radar plots of the LDA probabilities for terms within topic clusters.

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Figure 3. Word clouds for the five topic clusters (showing most frequent 50 words).

Cartographic Research in 2019

Five themes

- Theme 1: information visualization and cartography
- Theme 2: cartographic data and mapping
- Theme 3: spatial analysis and applications in cartography
- Theme 4: methods and models in cartography
- Theme 5: GIScience

Geog 183: Cartographic Design and Geovisualization, Spring Quarter 2020

Class summary

What we have covered

- Lecture 1: Scope of the class--GIMP and Inkscape fundamentals
- Lecture 2: The human vision system
- Lecture 3: Thematic cartography, geovisualization and visual analytics
- Lecture 4: A brief history of information graphics
- Lecture 5: Choropleth and bivariate maps and classification
- Lecture 6: Map types and Data types
- Lecture 7: Color and its use
- Lecture 8: Toponymy, typography and map text
- Lecture 9: Principles of map design and layout

What we have also covered

- Lecture 10: Production, Reproduction and Dissemination
- Lecture 11: Dasymetric and isarithmic mapping
- Lecture 12: Point symbol and flow maps
- Lecture 13: Map animation
- Lecture 14: Visual analytics and data exploration
- Lecture 15: Dealing with Uncertainty
- Lecture 16: Web-based cartography
- Lecture 17: Cartography in virtual environments
- Lecture 18: Research in Cartography and Visualization

In labs

- GIMP/Inkscape and others
- Choropleth mapping, QGIS
- QGIS for proportional circles, cartogram
- Design of a locator map for navigation/hiking
- Interactive web mapping with R-shiny and COVID-19 data

Learning Goals for Geog 183

- Understand and implement principles of good design in cartography
- Understand human vision and how it influences perception and cognition
- Become familiar with using open source tools to improve the visual quality of web-based and other maps
- Cover the scope of contemporary thematic cartography and web mapping
- Gain hands-on experience in designing and improving web based maps
- Master skills that will transfer to a host of other classes and to life beyond UCSB

Consider….

- Using web and other software mapping tools, almost any idiot (or bot) can create a map
- It takes knowledge and skill to create a ***good*** map
- It takes experience, skill, creativity and hard work to create a ***great*** map
- Fortunately, maps can be sequentially improved
- Good design follows known principles, and uses cartographic methods correctly
- Can also employ user centered design
- Same goes for much of graphic design, information graphics etc.

Final…ly

- Take home exam distributed by Gauchospace on 6/4/2020
- Due by Thursday June 11th 5:00pm
- Covers whole class
- 3 Essay style short answers—2-3 paragraphs
- Use word doc and your own words
- Open book, notes, web
- Use graphics if you wish
- Submit final to kclarke@geog.ucsb.edu, or upload in Gauchospace
- Grades will be posted to Gauchospace and egrades at the same time