



# Conceptualizing the Spatial Humanities and Humanities GIS

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# Introduction

- Presentation focuses on three related themes
  - Conceptualizing the challenges facing the Spatial Humanities
    - Five points (of many)
  - Identifying the potential contributions of GIScience and Geography to advance the Spatial Humanities
  - What is a Humanities GIS?
    - What is different about a Humanities GIS from a GIS
      - just content
- Need for theoretical engagement between humanities and GIScience to shape the future of spatial humanities
- Bodenhamer, D., Corrigan, J. and Harris, T. (eds) (in press) *The spatial humanities: GIS and the future of humanities scholarship*, Indiana University Press.



## 1. A fundamental challenge

- A positivist science meets humanist tradition
- Spatial humanities - a GIS led rediscovery of the power of the map and mapping – that space matters
- GIS - early adoption in science - then social science
  - Humanities much later
    - not just technophobia or concern about subversive insertion of the social sciences into the humanities
- Contrasting epistemologies
  - GIS space as entities, fields, objects, attributes, spatial primitives, geometric topology, schemas, focus on accuracy and precision, and ultimately, reductionism
  - Spatial analysis, modeling, optimizing solution space
  - Scientific method – quantitative and cartographic space



## Contrast to the humanities

- Nuanced emphasis on the individual and the unique
- Prominent role of story telling and multiple media
- Question the emergent complex of text and narrative
- Interlace textures of experience, memory, artifact
- Maintain imprecision, uncertainty, ambiguity

GIS pushes a disambiguation of knowledge – whereas humanities treats knowledge as multivalent and equivocal – seeks to maintain contradictions and premature resolution

- Qualitative humanism vs. quantitative GIS too simplistic

Misalignment of respective ontological and epistemological understandings of the world?

- Humanities GIS as oxymoron – a contradiction



## 2. GIS as spatial information science and Geography

- Resemblance to GIS and Society debate - PGIS, Critical GIS and understanding of reality
- Debate focused on GIS as only one abstraction of reality - an objective reality discovered through observation and testing - based on the scientific method
- Debate claimed that GIS privileges certain ways of knowing the world and imposes its own conceptual and logical models – filtered by user and the technology – that GIS marginalizes other ways of knowing – in particular local community knowledge (largely represented in qualitative forms) leading to structural knowledge distortion – spatially deterministic - silences in the data – no data no geography - GIS ignored multiple realities
- Similarities to the Humanities
  - Narrative, qualitative data, ways of knowing, nuanced



## Prompts questions:

- What role does space play in human behavior and affairs
- How does spatial information science bring about additional insight or a rethinking of humanities scholarship?
- How are concepts and spatial thinking expressed in GIS and how does this influence our understanding of the humanities

Requires a focus on GISc - not just on GIS as method

- A GISc interface with the Humanities creates a deeper, more challenging, and intellectually rewarding return than a focus on GIS as spatial tool box
- Cannot focus solely on nuts and bolts of space without the geographical concepts that drive GISc
- The spatial turn must be more than a focus on GIS as method
- A closer alignment between Humanities, GISc, **and** geography
  - Acknowledge that human activity does not take place in a spatial vacuum



### 3. Centrality of space and time in Humanities GIS

- Humanities GIS must provide a framework for spatio-temporal analysis
- Not just chrono-geographic – discontinuous time
- Time as history - space as geography – too simplistic
- Change occurs across space and time simultaneously
- Space and time dependency especially in the humanities
- Spatial **and** temporal turns – not prioritized
- Massey - exploring multiple trajectories through space and time allows for complex stories of how places change



- Spatial humanities should embrace the spatio-temporal and push the GISc envelope as it grapples with the complexities of space-time
- Make it a distinguishing characteristic of a Humanities GIS?
- As with handling geo-narrative and qualitative data – the humanities can challenge the GIS community to develop components suited to their needs



## 4. Space, Place, Deep Contingency and Deep Mapping

- GIS focus on space and spatial analysis
- Humanities focus is on place and the contested constructedness of place, linking locale, myths, symbology, ideology, events, and processes that make up local place and place making (Ayers)
- Fine grain studies of place contribute through interconnected systems to our understanding of higher scale processes and the interpretation of the consequences and resonances of events as they ripple across time and space
- ‘we cannot ‘read-off’ the meaning of place from spatial configuration alone....one cannot reconstruct a past world of meaning from a Cartesian template of geometrical form” (Thomas, 1996)
- Challenge for GISc



- How can geospatial technology speak to the contingent nature of cultural processes, of agents of change and transformation, and the humanities penchant for dismembering generalizations, rethinking, and recombining (Corrigan)
- Deep contingency (Ayers) - domains of public, private, economic, social, political, religious, and civil military are connected through deep contingency that fuses place and time - where structures are articulated in a cascading, spiraling rupture of local social processes in response to structural transformations of power at other scales - A collage of moments
- How do we handle deep contingency and thick description where all social life is contingent, implicated and unpredictable in a Humanities GIS?



# Deep mapping

- Intensive topographical exploration of place
- Weaves a complex of multi-layered deep maps of both the invisible and visible aspects of place
- Heavy in narrative, autobiography, art, folklore, stories, and memory interlaced with the physical form of space
- ‘records and represents the grain and patina of place through the juxtapositions and interpenetrations of the historical and the contemporary, the political and the poetic, the discursive and the sensual’ (Pearson 2001)
- William Least Heat-Moon *PrairyErth: a deep map* (1992)



William Least Heat-Moon *PrairyErth: a deep map* (1992)

“...you may already have come across a set of detailed instructions, a map with every bush and stone clearly marked, the meandering courses of dry rivers and other geographical features noted, with dotted lines put down to represent the very faintest of trails. Perhaps there were also warnings printed in tiny red letters along the margin, about the lack of water, the strength of the wind and the swiftness of the rattlesnakes. Your confidence in these finely etched maps is understandable, for at first glance they may seem excellent, the best a man is capable of; but your confidence is misplaced. Throw them out. They are the wrong sort of map. They are too thin. They are not the sort of map that can be followed by a man who knows what he is doing. The coyote, even the crow, would regard them with suspicion.”



Similar to Yi-Fu Tuan *Topophilia* – the connectedness between human emotion and the physical fabric of landscape – a sense of place

- A sensuous and reflexive GIS?  
‘sight paints a picture of life, but sound, touch, taste, and smell are actually life itself. A sensuous geography may therefore... reassert a return of geographical [and historical] study to ...everyday life as a multisensual and multi-dimensional situatedness in space and in relation to places” (Rodaway, 1994)
- Phenomenology and GIS – immersive Virtual Geographic Environments
- Moves GIS from mapping observations to one of habitation – experiencing and engaging in the world
- From observer to participant
- ‘a sense of being in the world’
- a deeply layered, sensuous, and reflexive spatial humanity



## 5. Looking beyond GISystem

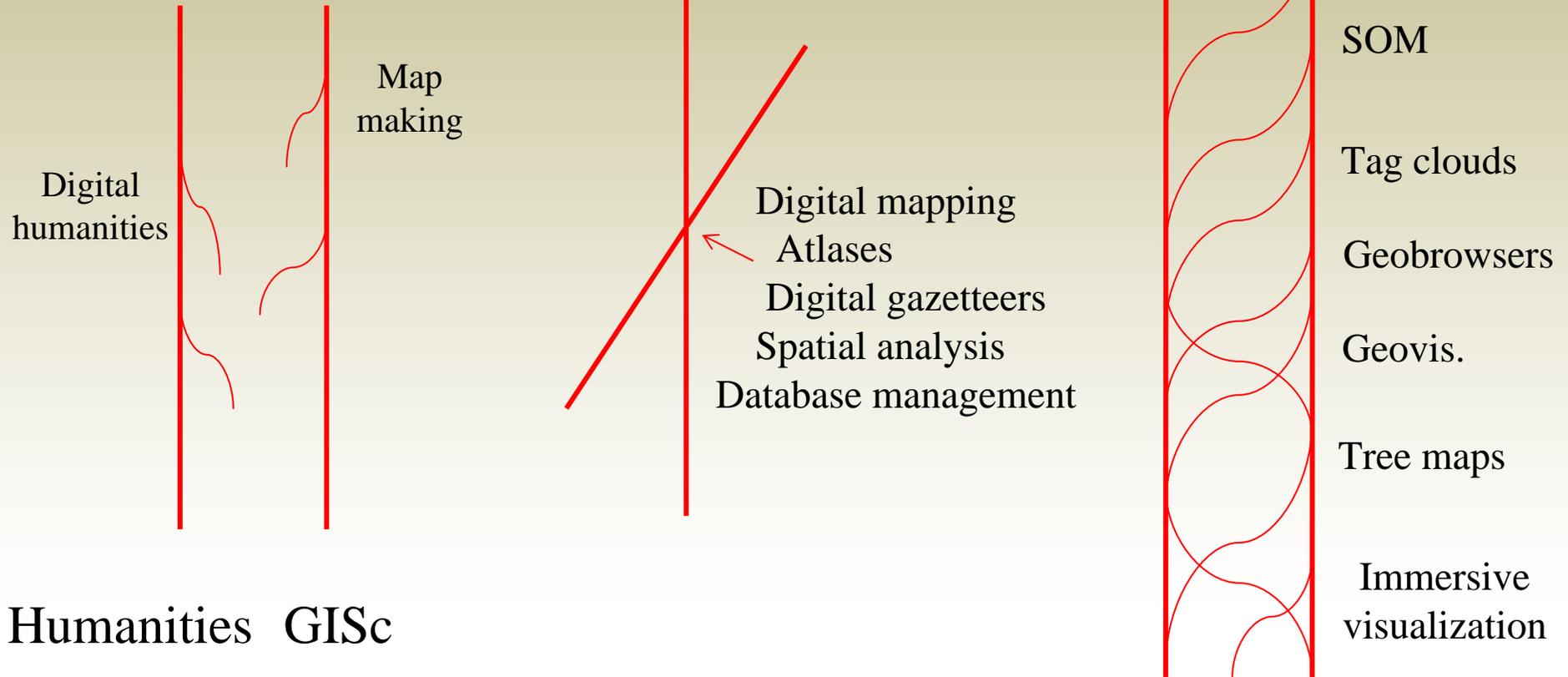
- GIS is powerful but...
  - ‘If the only tool you have is a hammer, you tend to see every problem as a nail’ (Maslow 2008)
- Heavy focus on GIS
  - What of other GISc technologies and techniques suited to advance the needs of the Humanities.
- A street light metaphor.
- Early intersection of GIS and humanities represents the low hanging fruit – future interactions?
- GIS as panacea – one shoe fits all
- Other concepts and techniques in geography and GISc
  - Relative space



## Previous

## Current

## Future





# Immersive environments

Self organizing maps

Cartograms

RDBMS

Object-oriented GIS

Augmented Reality

Geospatial semantic web

Serious gaming engines

Virtual Reality

Adaptive and assistive technologies

*Virtual GIS*

## Geographic Information

## Science

Data mining

Animation

Enhanced Location based Services

Mobile and wearable  
computing

Spatially embedded multimedia

Geovisualization

Global Positioning Systems

Tag clouds

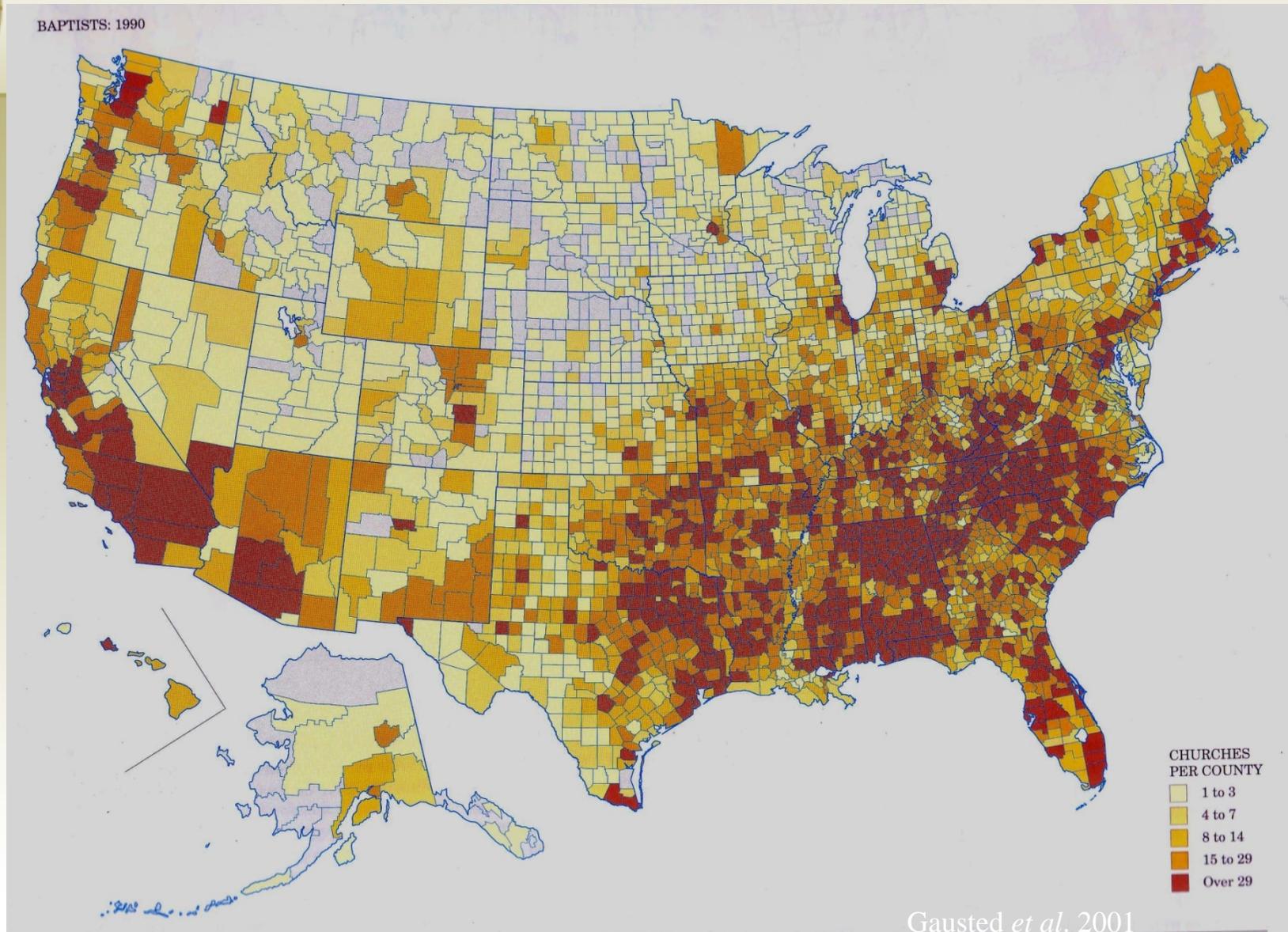
*Word Tree*

Exploratory Spatial Data Analysis

Tree maps

Virtual globes

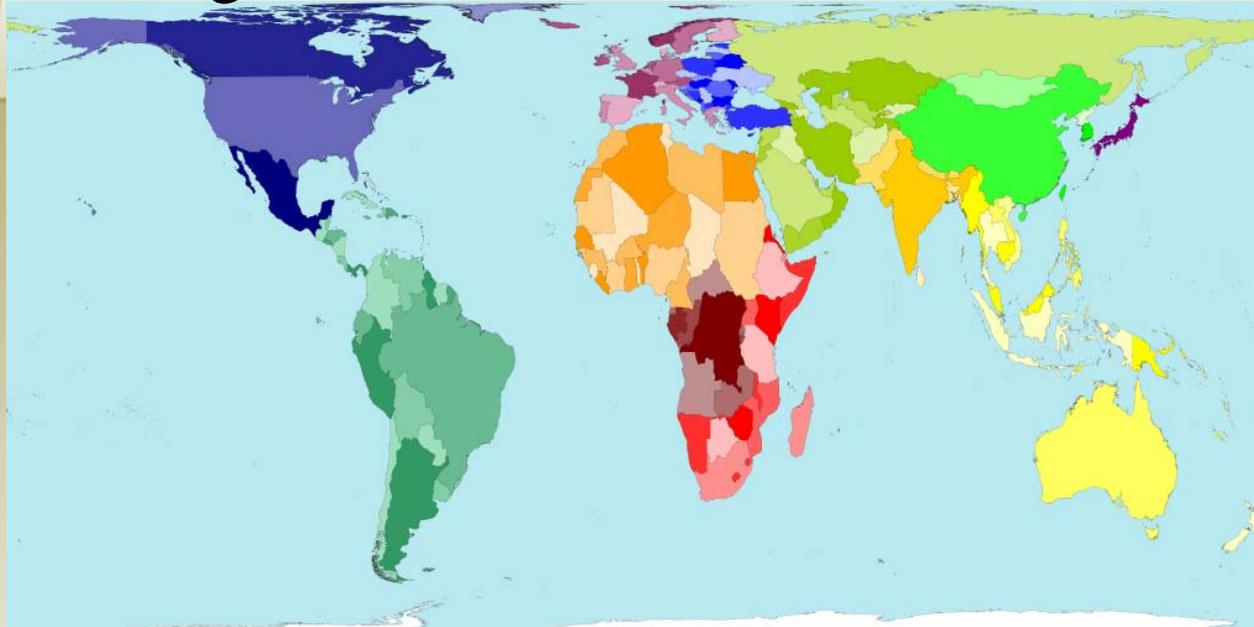
# Gaustad and Barlow (2001) Historical Atlas of Religion in America



The 'objective' map - Ecological fallacy - Modifiable Areal Unit Problem

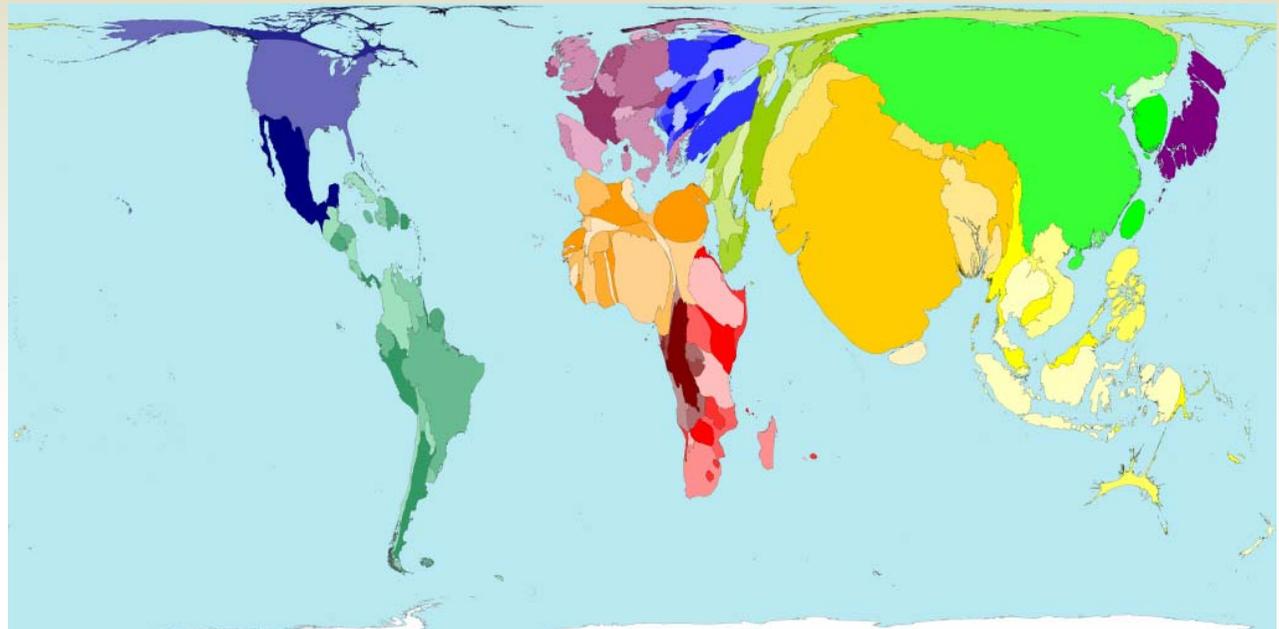


# Cartograms

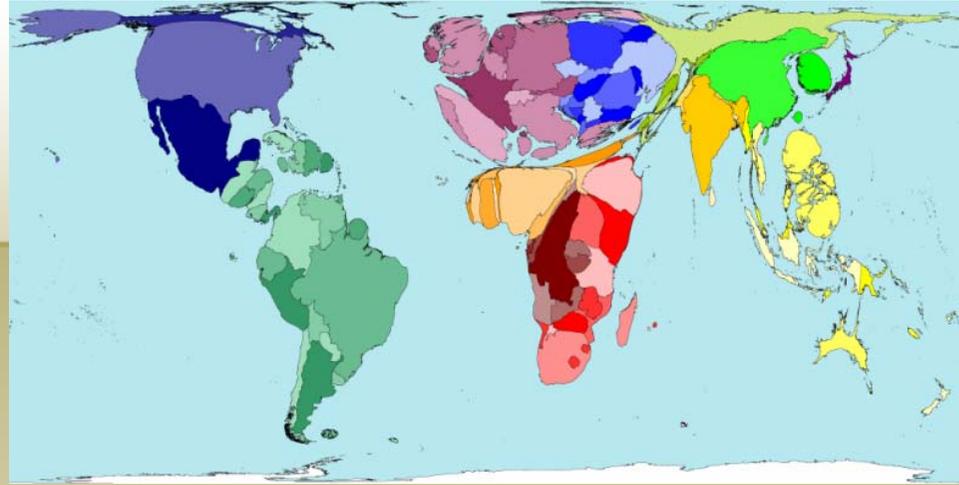


Conventional  
map

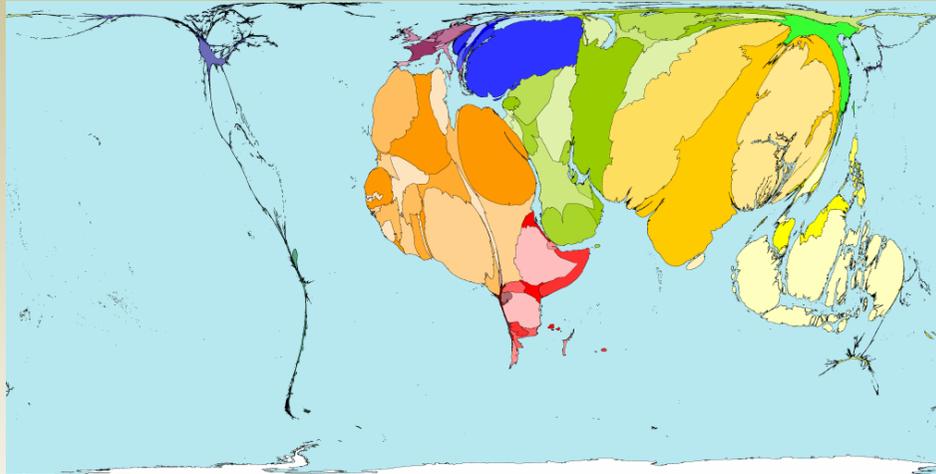
Based on population



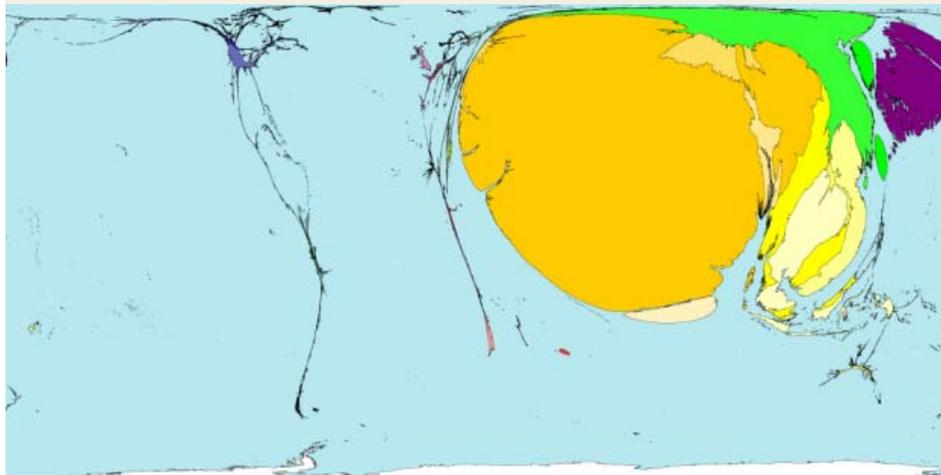
(worldmapper.org)



Christians



Muslims



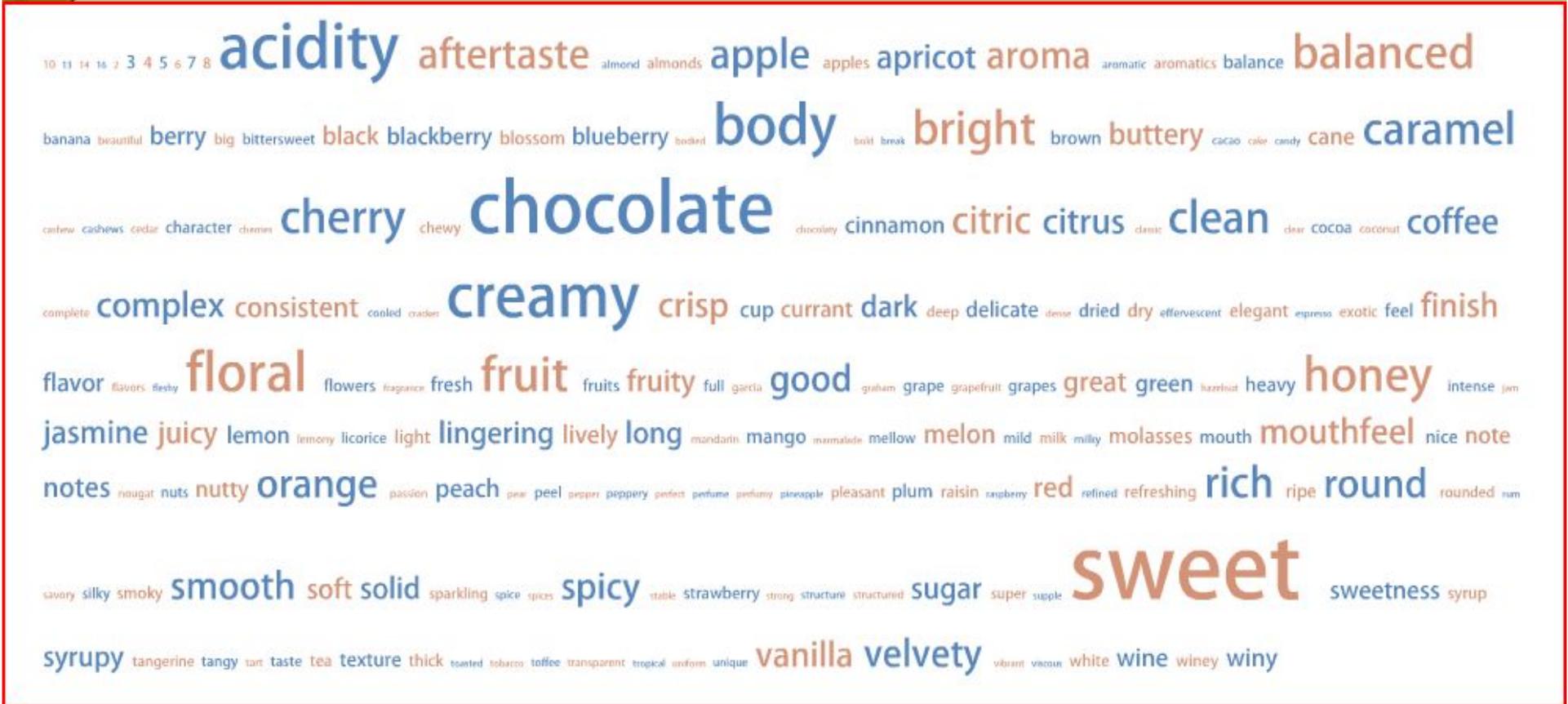
Buddhists, hindu, Jains, Sikhs







# Mapping taste - Fair Trade Coffee



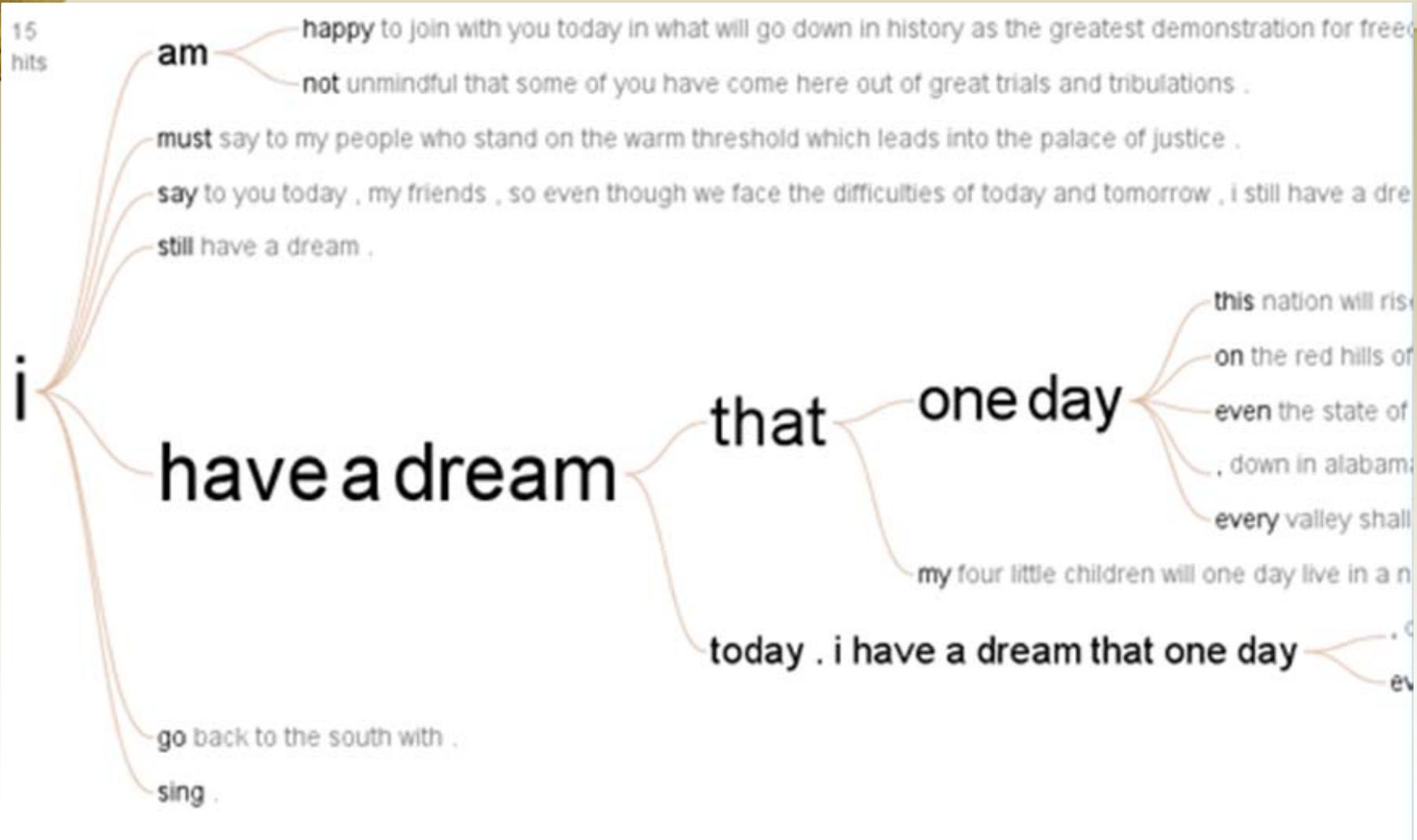
Spatialized tag clouds



# Double Word Coffee Descriptors

acidity caramel acidity chocolate acidity citrus acidity clean acidity complex acidity fruity acidity honey acidity rich acidity smooth acidity sweet aftertaste rich  
apple apricot apple chocolate apple cinnamon apple creamy apple juicy apple peach apples cashews apples sweet aroma refreshing aroma sweet balance lingering balanced acidity  
balanced clean balanced fruit balanced good balanced sweet berry spicy bittersweet chocolate black cherry black currant blackberry dark blossom cinnamon body chocolate body complex  
body creamy body delicate body floral body honey body mango body sweet body velvety body winy bright acidity bright aroma bright crisp bright lively  
bright sweet brown sugar buttery mouthfeel cane sweet caramel chocolate caramel creamy caramel good caramel honey cashews vanilla cherry creamy cherry floral cherry garcia  
cherry jasmine cherry sweet chocolate aftertaste chocolate black chocolate caramel chocolate creamy chocolate floral chocolate good chocolate honey chocolate notes chocolate red  
chocolate spicy chocolate sweet cinnamon graham citric acidity citric notes citrus fruit citrus sweet classic almonds clean bright clean cup clean sweet  
clean uniform coffee cherry complex flavors complex sweet consistent creamy cracker bright creamy body creamy chocolate creamy complex creamy honey creamy juicy  
creamy smooth creamy sweet creamy sweetness creamy winy crisp acidity crisp bright crisp clean cup floral dark cherry dark chocolate dried fruit floral 5  
floral note floral notes floral sweet fresh fruit fruit berry fruit peach fruit sweet good acidity good aroma good balance good body good solid graham cracker great acidity  
great aftertaste great balance green apple green apples green tea honey jasmine honey sweet juicy acidity lemon citrus lingering aftertaste lingering apples lively acidity  
long aftertaste long finish long sweet mandarin orange mango 3 milk chocolate mouth feel mouthfeel good mouthfeel sweet orange apple orange chocolate orange marmalade  
orange peel passion fruit perfect structure red fruit red wine refreshing lingering rich body rich creamy ripe fruit round acidity round velvety smooth velvety  
soft acidity soft floral solid coffee spicy creamy spicy green sugar cane super sweet sweet acidity sweet aftertaste sweet apple sweet berry sweet bright  
sweet buttery sweet caramel sweet cherry sweet chocolate sweet citric sweet clean sweet creamy sweet crisp sweet dried sweet finish sweet floral  
sweet honey sweet lemon sweet lingering sweet melon sweet orange sweet round sweet solid sweet vanilla sweet white sweet wine tea good thick body uniform sweet  
vanilla blossom vanilla cherry vanilla clean velvety body velvety mouthfeel velvety soft white chocolate wine perfect wine sweet winy chocolate

# Word Tree – unstructured text – word contexts



# Spatially embedded multimedia

The image displays two windows from a computer desktop. The left window is ArcMap, showing a street map with various colored polygons representing buildings. Two attribute tables are overlaid on the map. The right window is a Microsoft Internet Explorer browser displaying a photograph of a two-story brick house with a white porch.

**Attributes of census\_1910**

OID	STREET_NAM	HOUSE #	CENSUS_B	FAMILY_NAM	OCCUPANT	RELATION	GENDER
88	Alexandria	48	365	Brown	Emma	Daughter	F
89	Grand	300	366	Johns	W.S.	Head	M
90	Grand	300	366	Johns	Estelle	Wife	F
91	Grand	293	367	Leansperken	H.J.	Head	M
92	Green	293	367	Leansperken	Mau	Wife	F

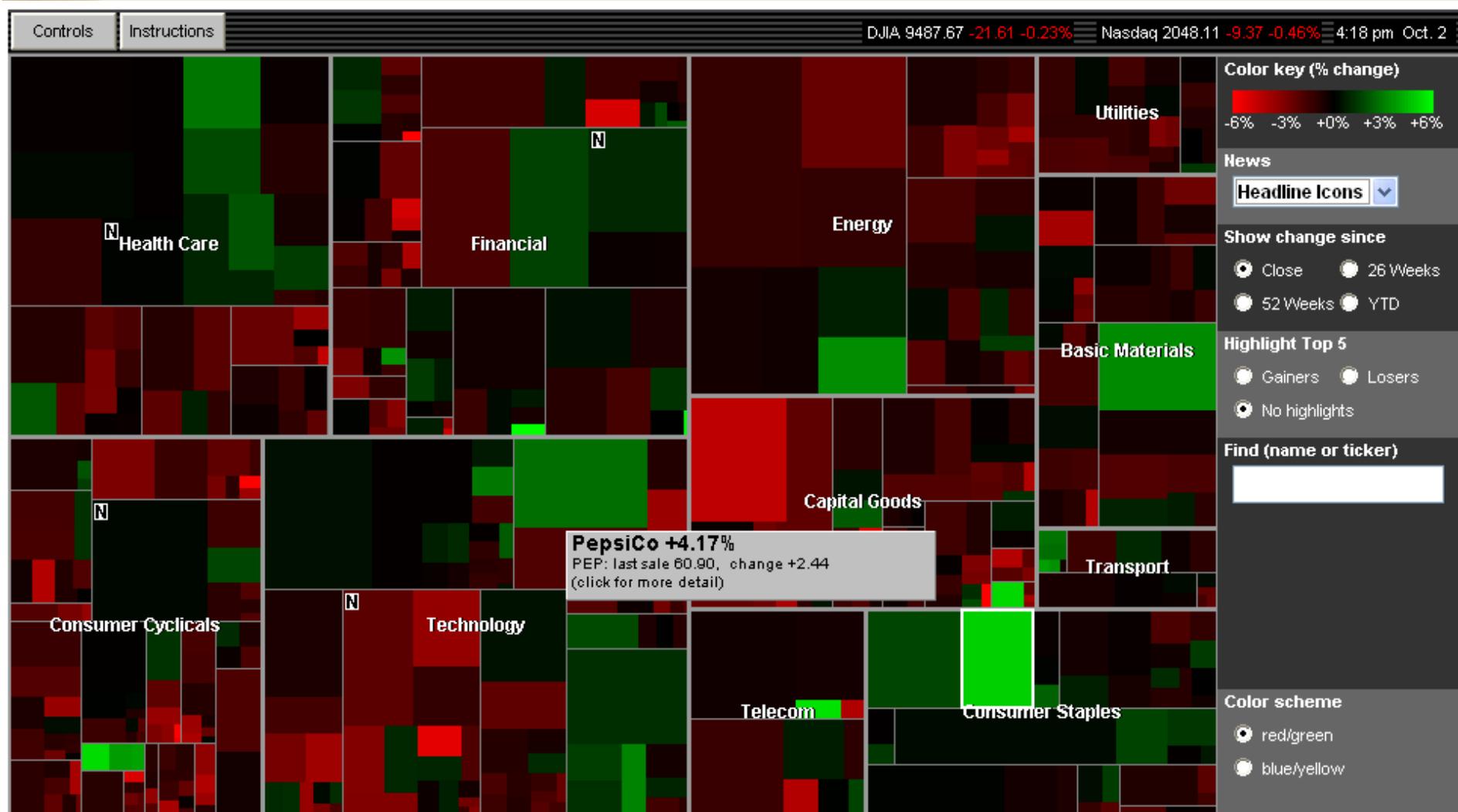
**Attributes of 1911\_structures**

FID	Shape*	Id	Identifier	Primary	Secondary	Street
1	Polygon	0	GRD018	0	0	
2	Polygon	0	GRD010	300	9999	Grand
3	Polygon	0	GRD009	294	9999	Grand

**Browser Address Bar:** H:\Morgantown\SouthPark\houses\GRD010.jpg



# Map of stock market changes at close Oct 2 2009



[Smartmoney.com/map-of-the-market](http://Smartmoney.com/map-of-the-market)



# Visualization – brushing and linking

Musicals

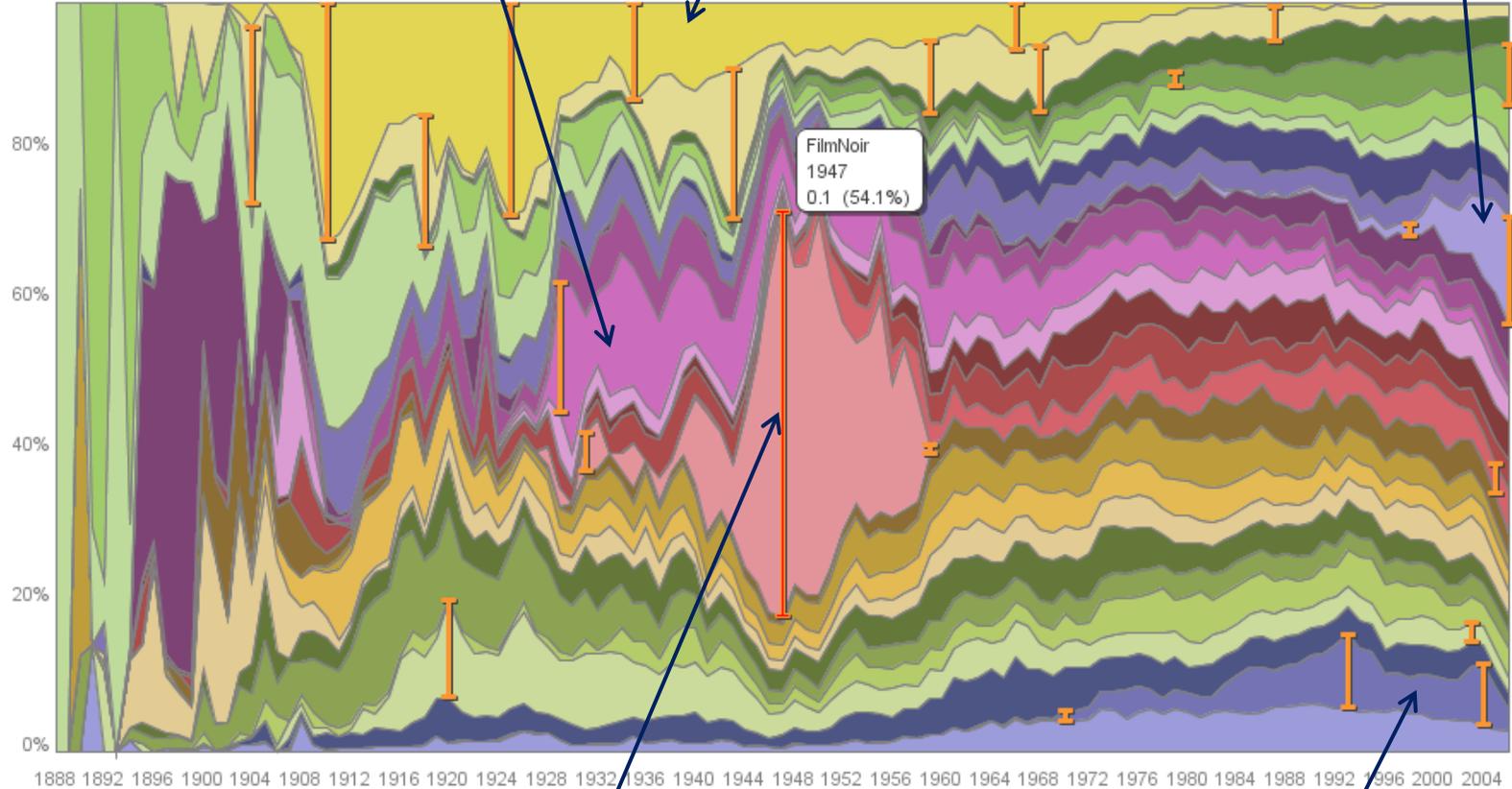
Westerns

Reality TV

## Legend

Click to select,  
Ctrl-Click: multiple  
Shift-Click: range

- Action
- Adult
- Adventure
- Animation
- Biography
- Comedy
- Crime
- Documentary
- Drama
- Family
- Fantasy
- FilmNoir
- GameShow
- History
- Horror
- Music
- Musical
- Mystery
- News
- RealityTV
- Romance
- SciFi



Click or ctrl-click to highlight points on graph.

Film Noir

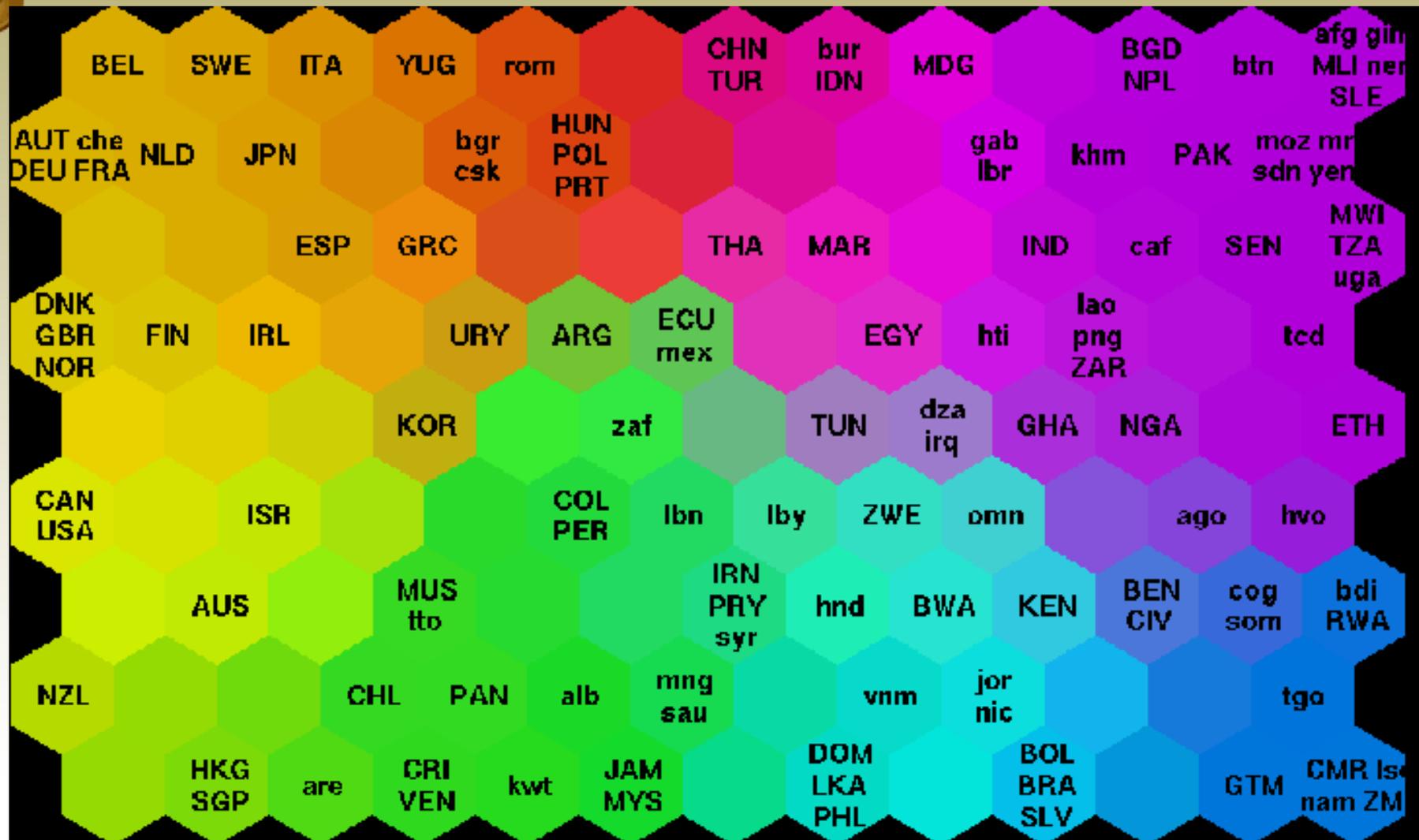
Adult

% of items shown



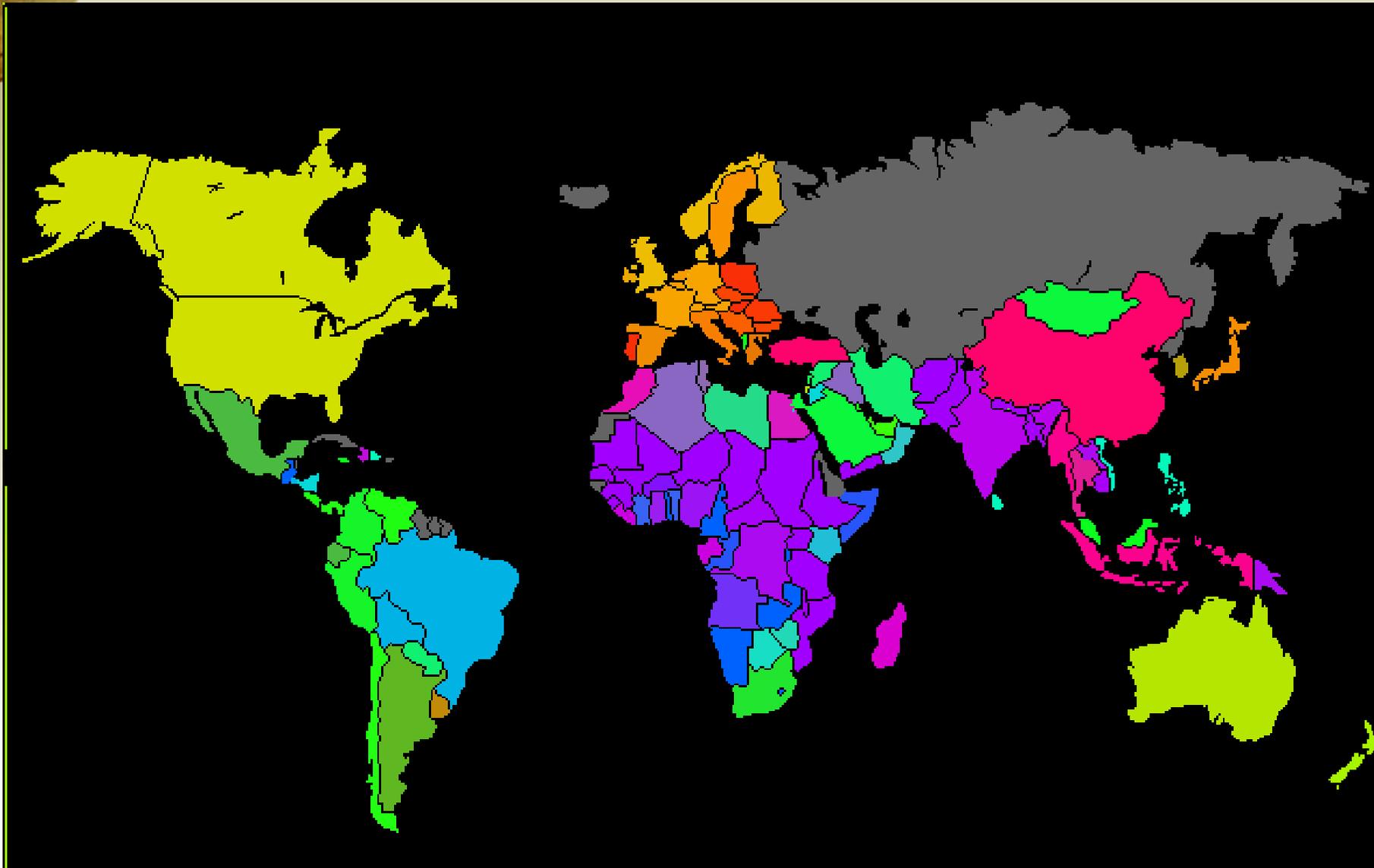
# Self organizing maps

Countries organized based on 39 indicators of poverty



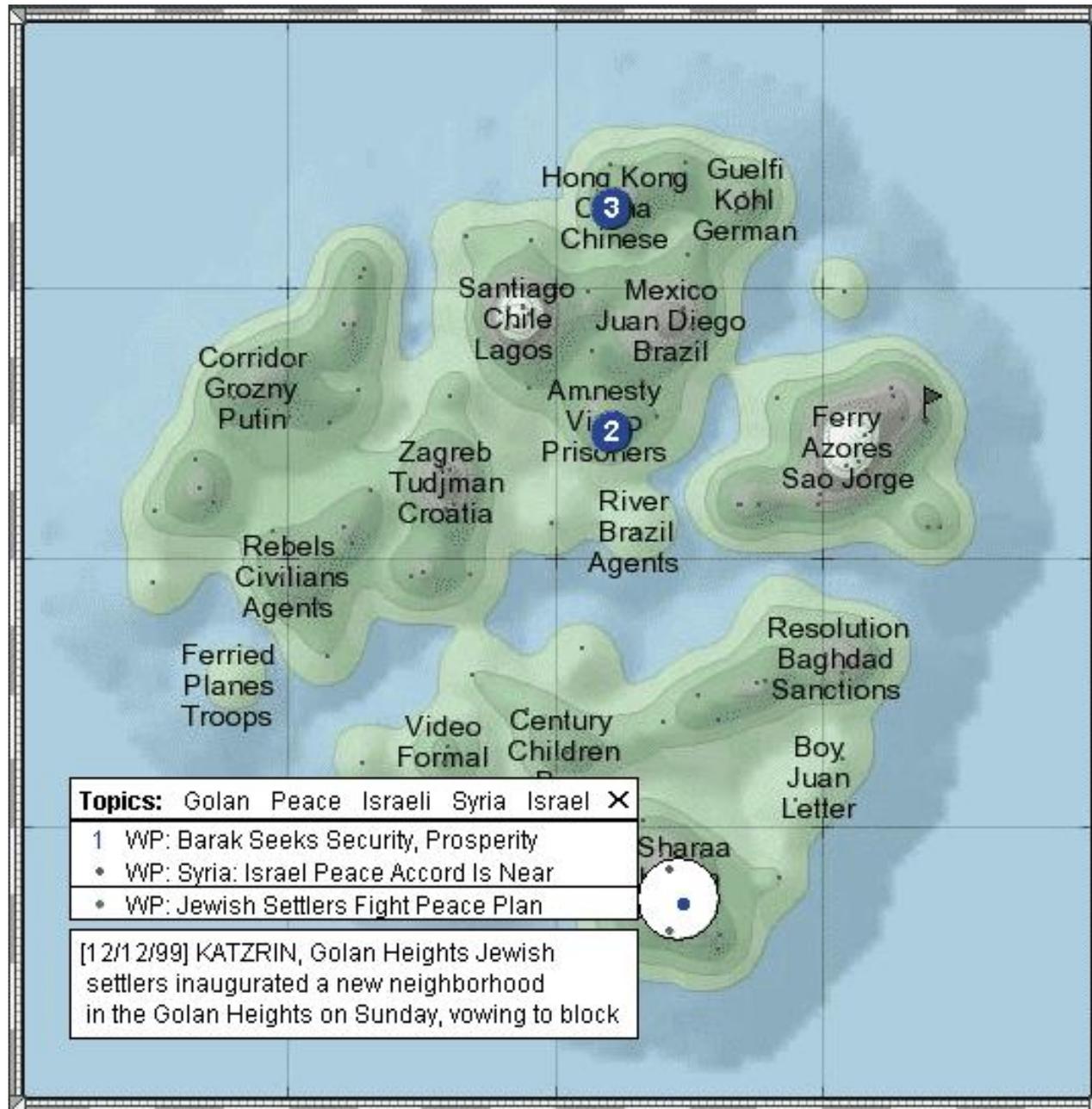
<http://www.cis.hut.fi/research/som-research/worldwide.html>

# Countries mapped by SOM based on poverty type



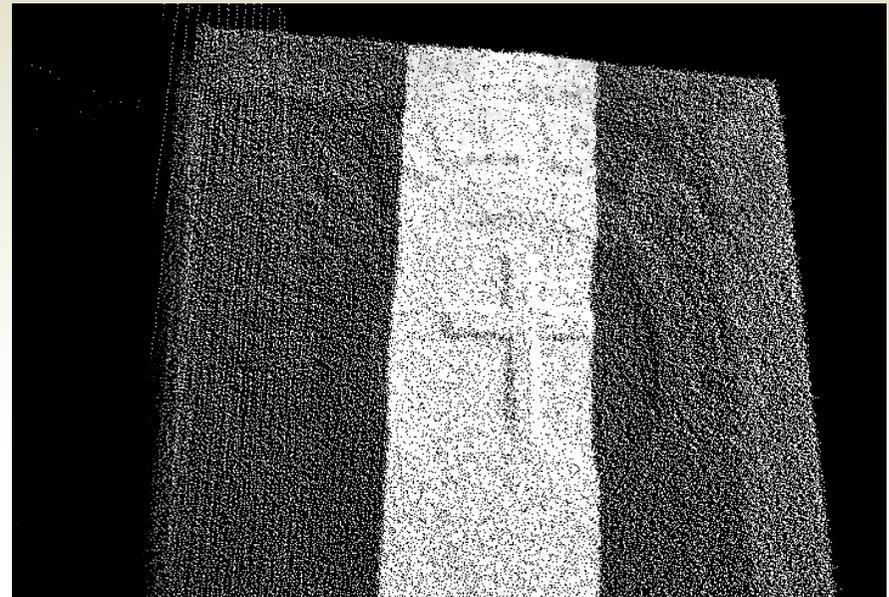
# Self organizing maps

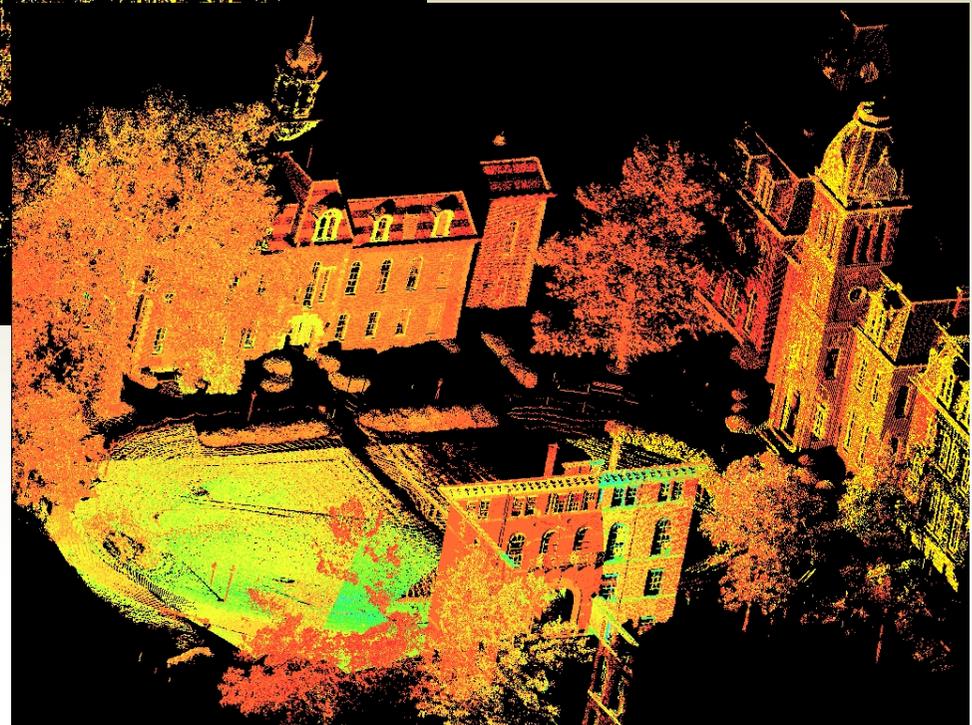
Spatialized topographic portrayal of 121 online news stories  
Dec 13th 1999





Side scanning  
laser



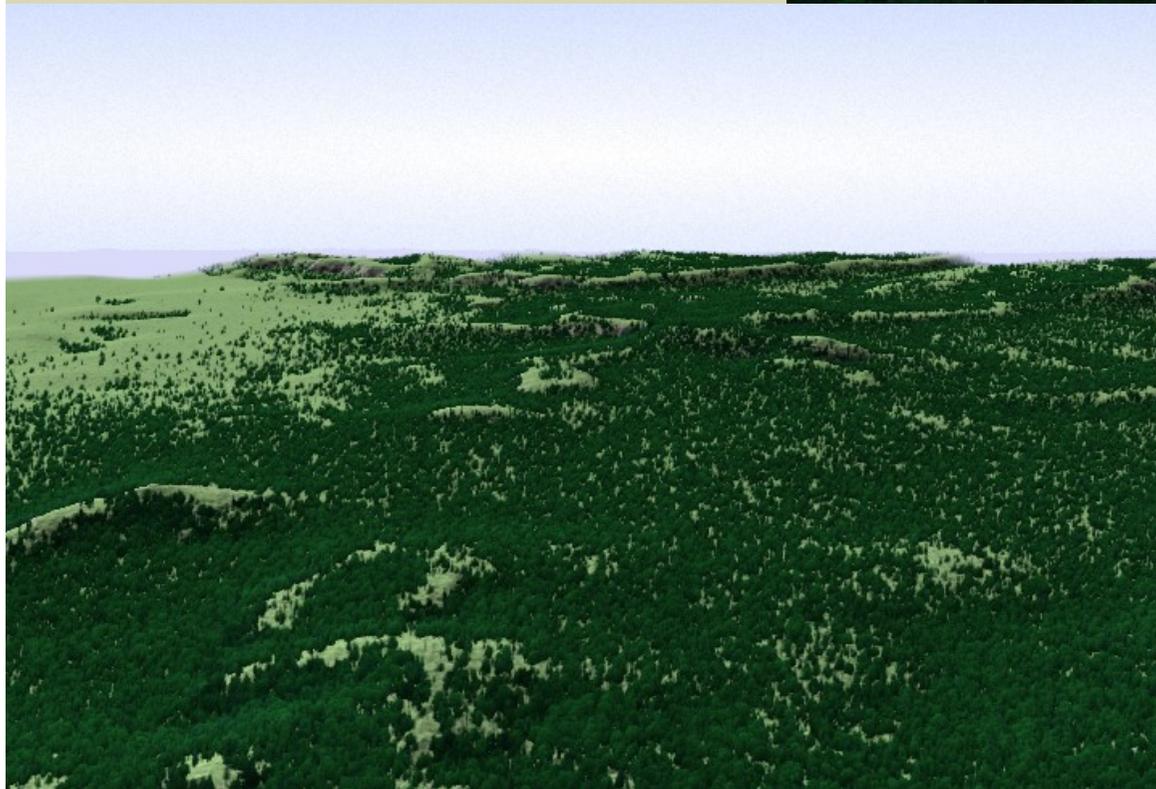
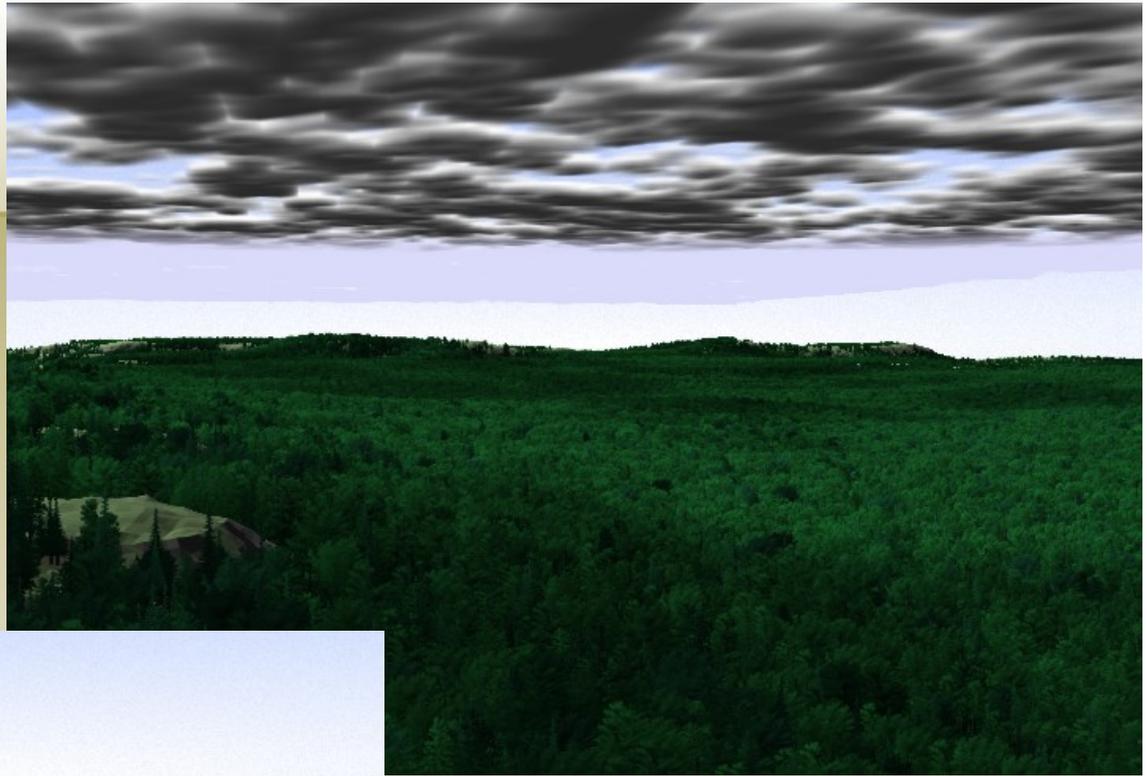


Point clouds  
Photosynth (photographs)

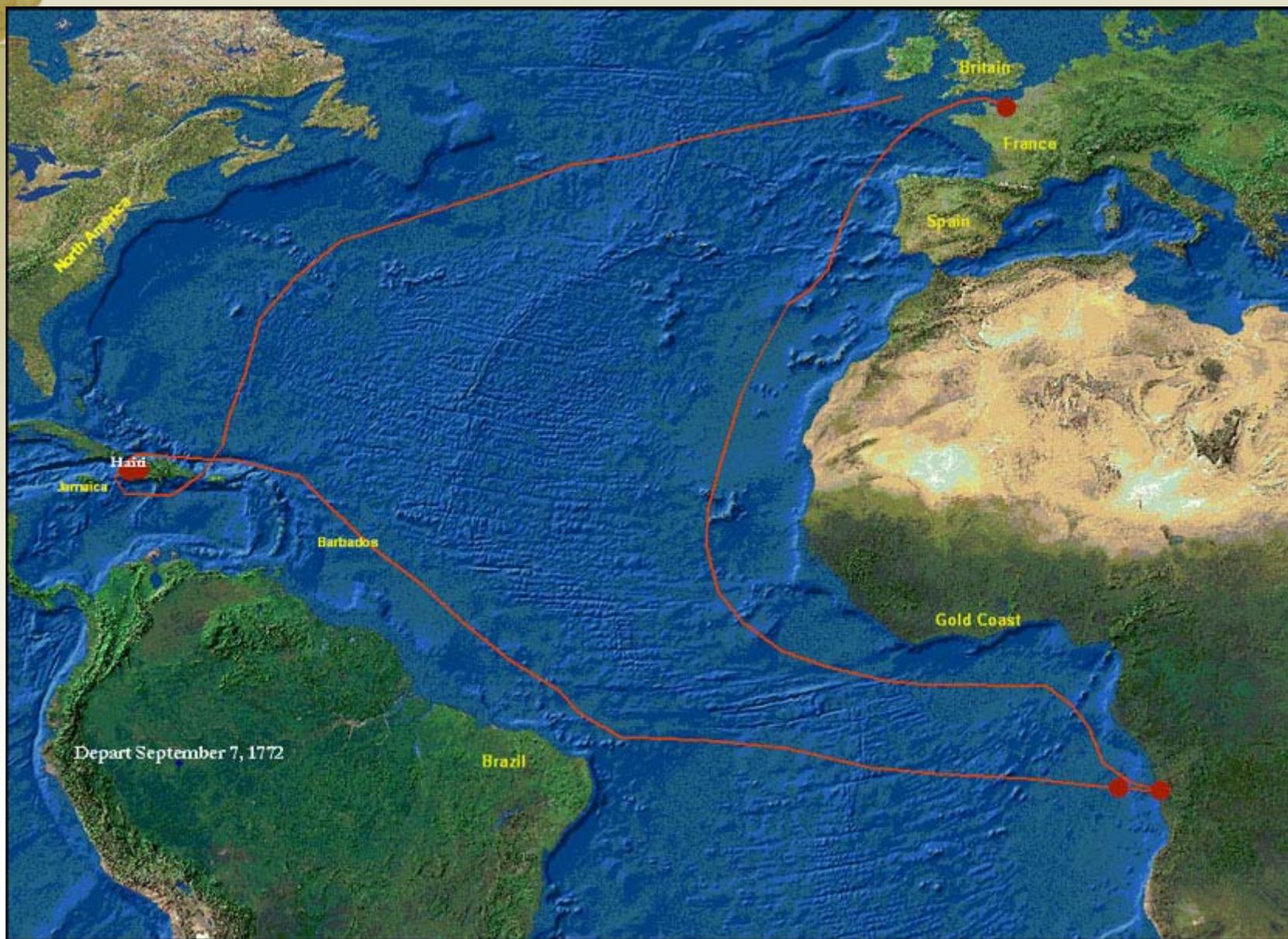


# Dynamic virtual animations

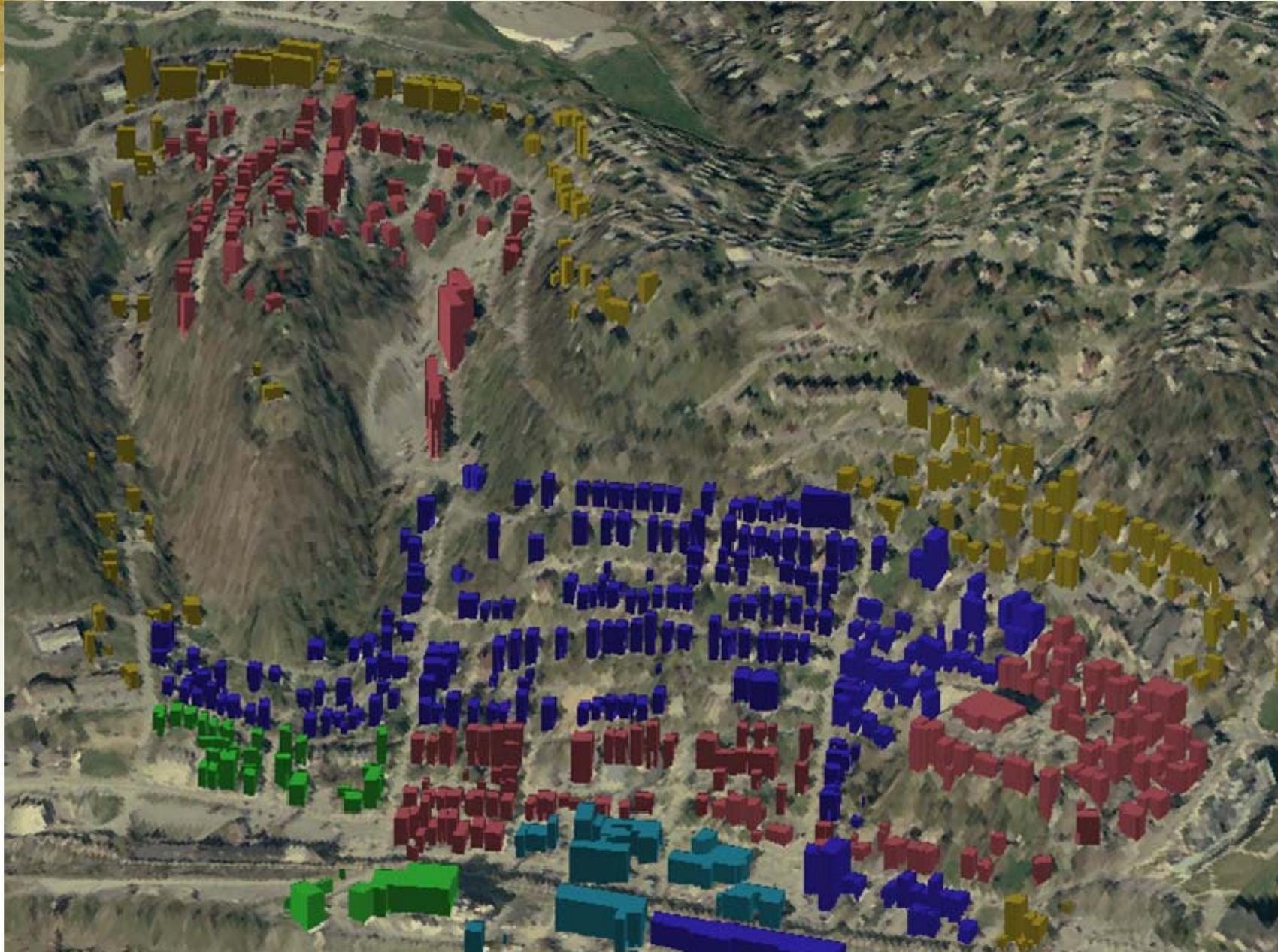
The Danebury  
Iron Age landscape  
3000BP



# Animation (the slave ship Diligent set sail Jul 14 1771)



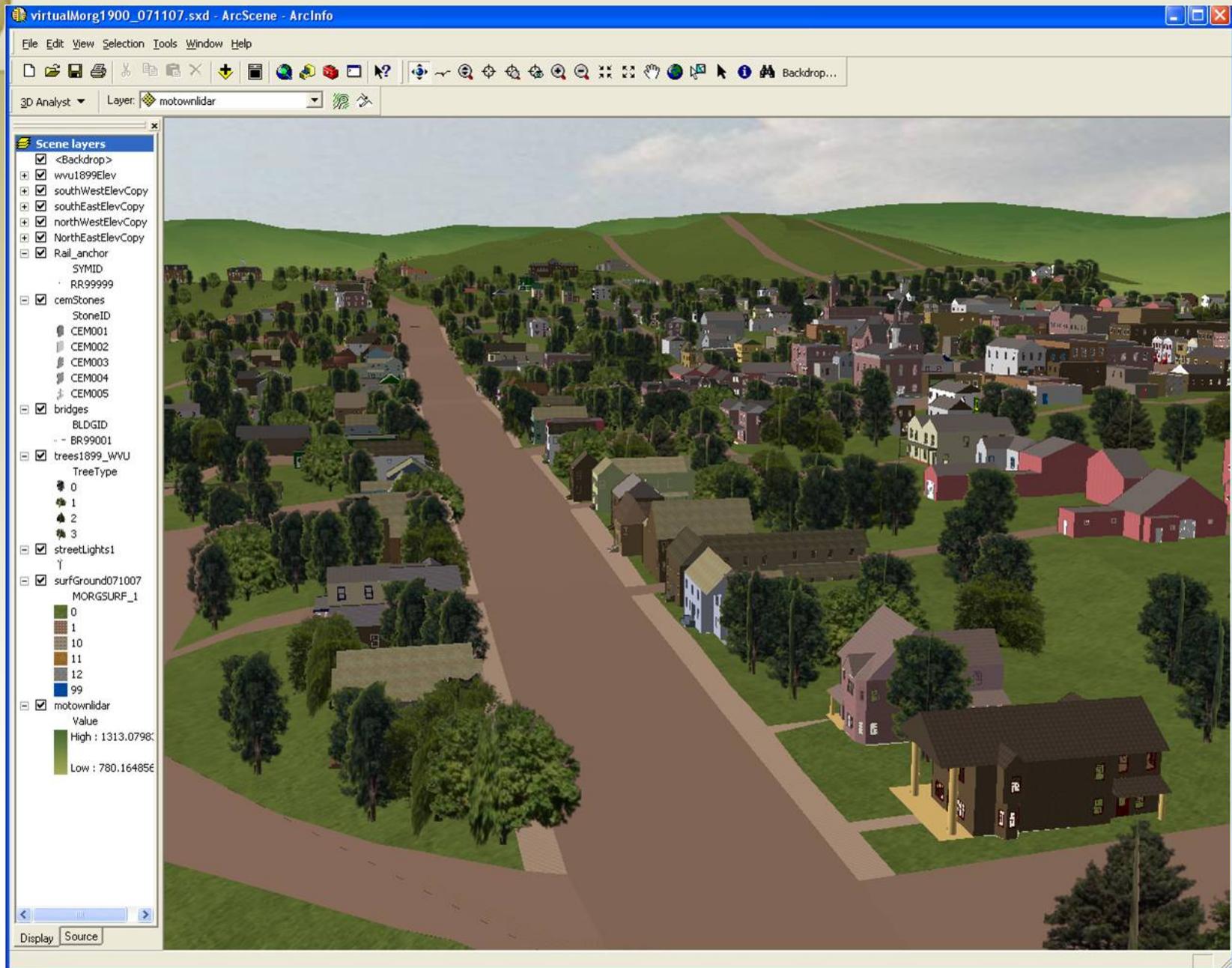
# Virtual globes



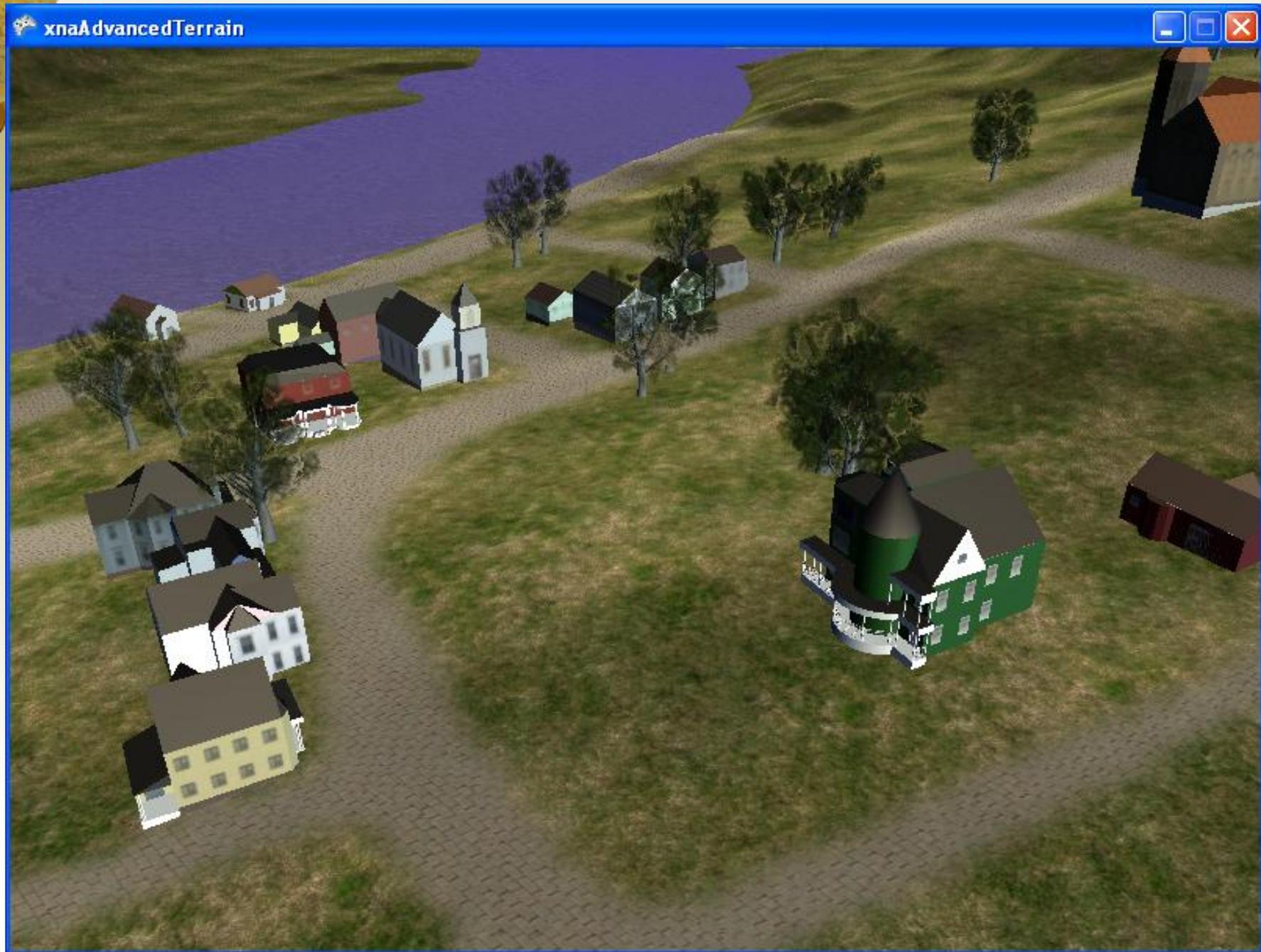
# Virtual Reality and GIS



# ArcScene and Sketch-up Morgantown, WV 1900 (Interactive)



# Serious gaming engine – XNA – using rules, rhetoric, avatars





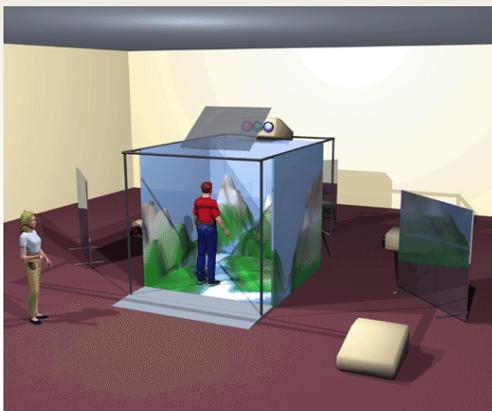
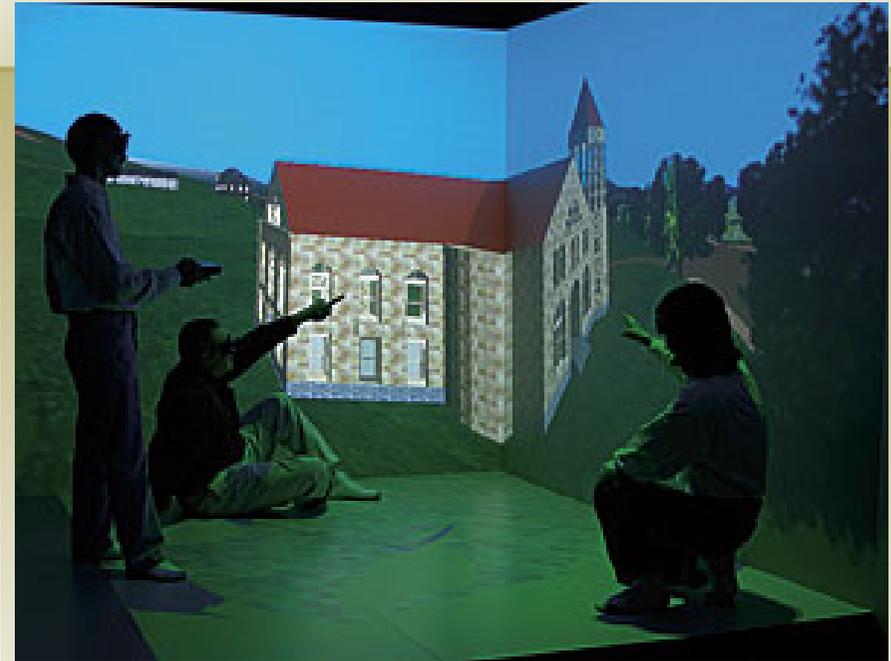
# XNA and GIS - spatial proximity and embedded media







# Interactive, immersive, and experiential visualization



‘a sense of being there’



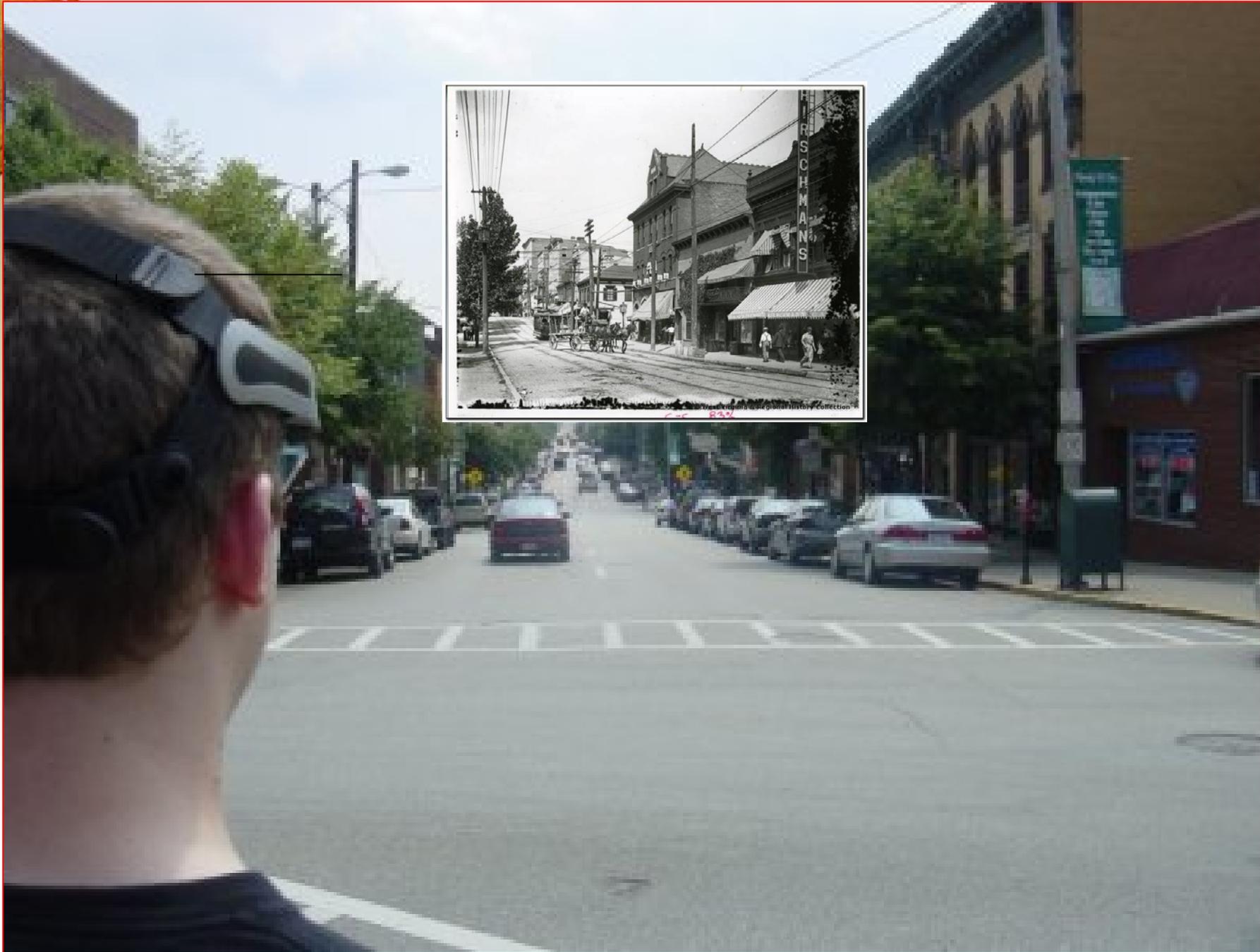
Adding sound and smell to visual cues – toward a sensuous GIS



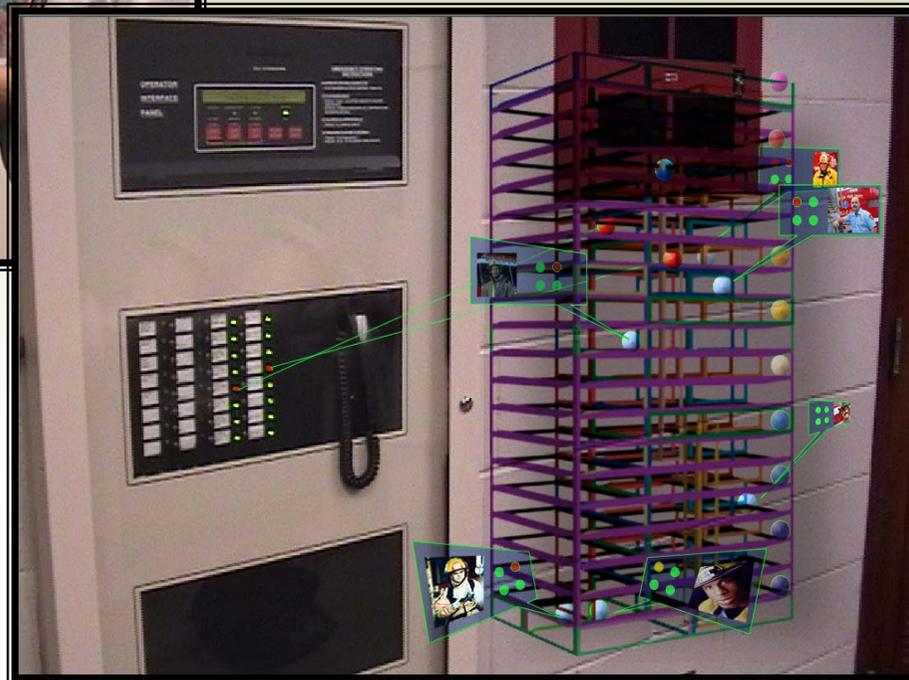
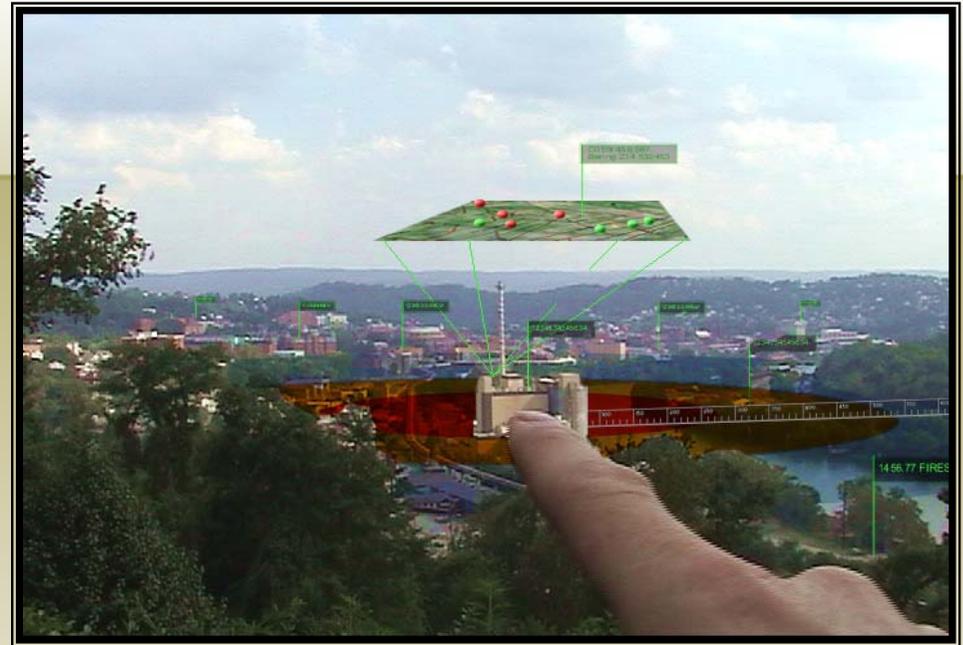
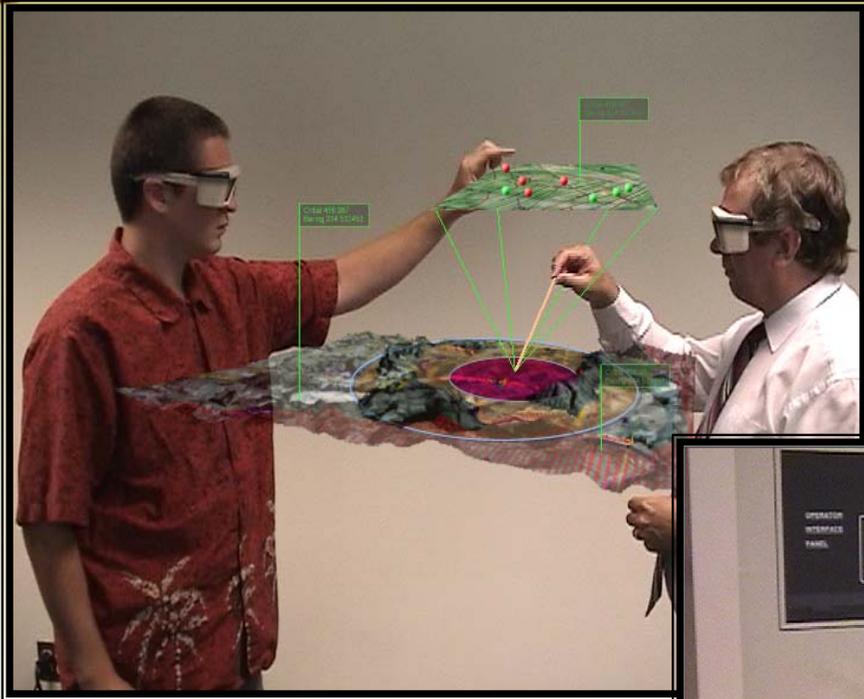
# GIS, Location Based Services, Visionware, wireless, and augmented reality



The MicroOptical-Composite:  
Integrated Tangleless Display Prototype



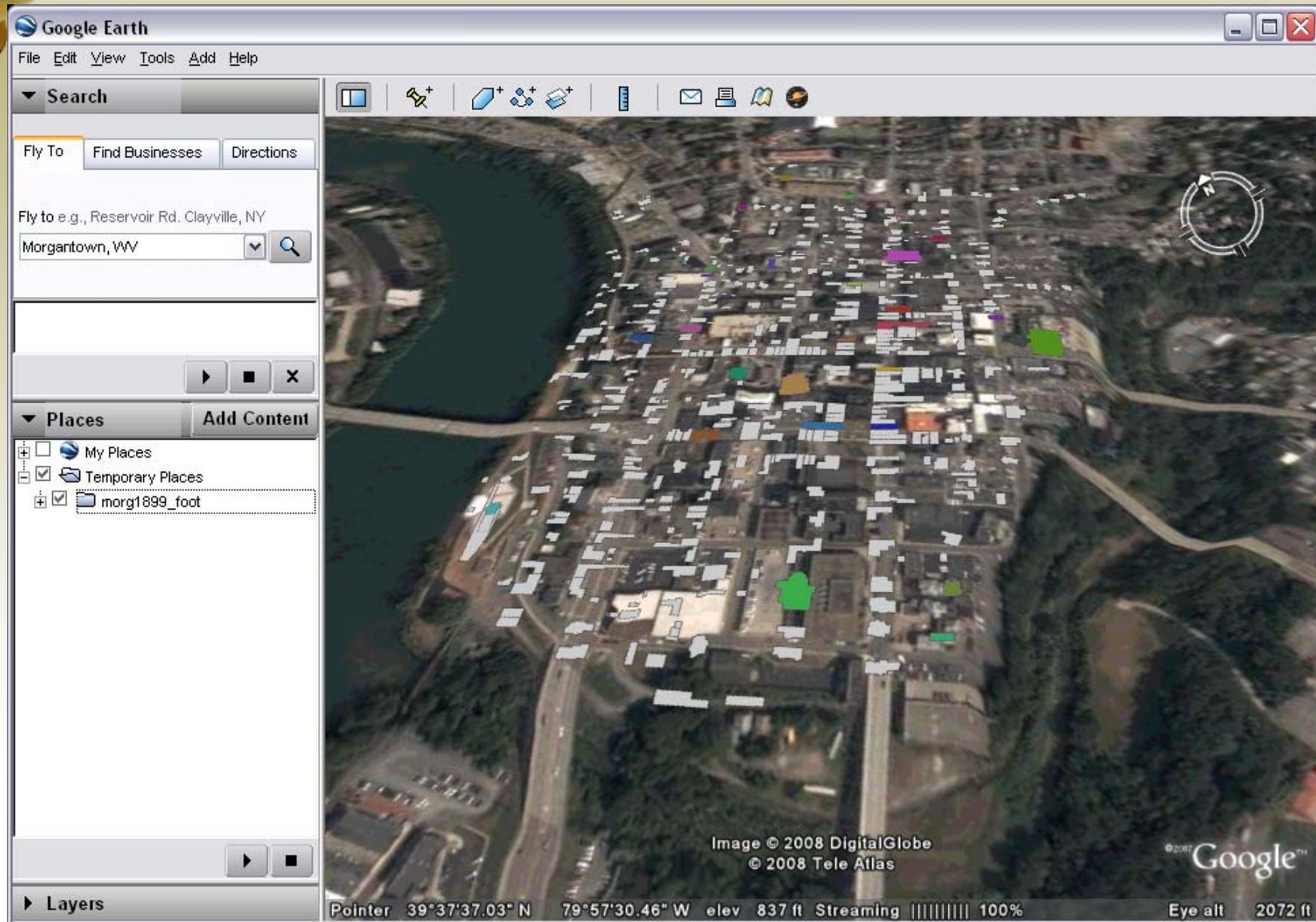




concept

# Geospatial semantic web – a Pareto GIS for the Humanities?

(web services, mashups, geotagging media, VGI, geoparsing, APIs closes the gap between data producers and consumers)





## Conclusion

Humanities GISc is:

- sensitive to the ontology, and epistemology of the humanities
- spatially aware, multimedia capable, handles nuanced data categories
- a fusion of space and place and time, place-based narratives, and complex layering that enables the deep mapping of place
- non-authoritative, non-objective, and negotiated between experts and contributors, spatial story telling
- blends data with judgments, and integrates multiple voices
- framed as a conversation and not as a statement
- inherently unstable and continually unfolding and changing in response to new data, new perspectives, new insights
- an ambiguated representation of culture with all its contradictions and complexities that are grounded in both human subjectivity and objective space