

Spatial Visualisations

Think spatial

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Monday, October 13, 2014



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The big picture

What is it all about

Global Peace Index



Source: Defense Intelligence Unit

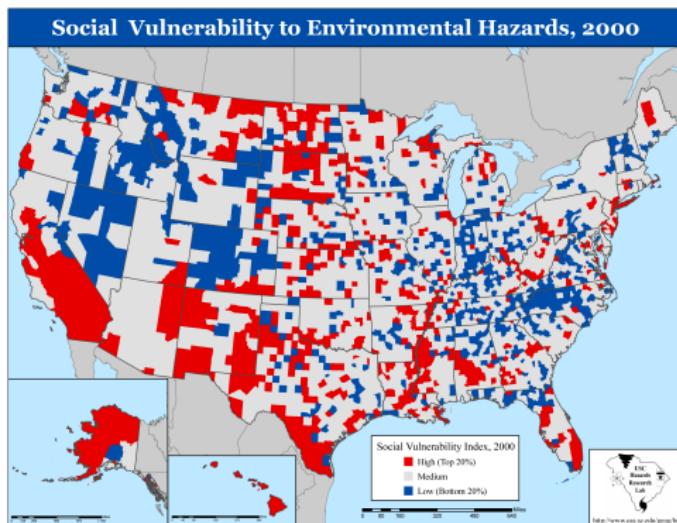
http://www.huffingtonpost.com/jim-luce/most-peaceful-states_b_1498090.html

The global peace index

- ▶ The level of organized conflict
- ▶ Relations with neighboring countries
- ▶ The level of perceived criminality in society
- ▶ Political instability
- ▶ Terrorist activity
- ▶ The number of homicides per 100,000 people
- ▶ The level of violent crime
- ▶ Likelihood of violent demonstrations
- ▶ The number of jailed population per 100,000 people
- ▶ Nuclear and heavy weapons capability
- ▶ Ease of access to small arms and light weapons

Social vulnerability

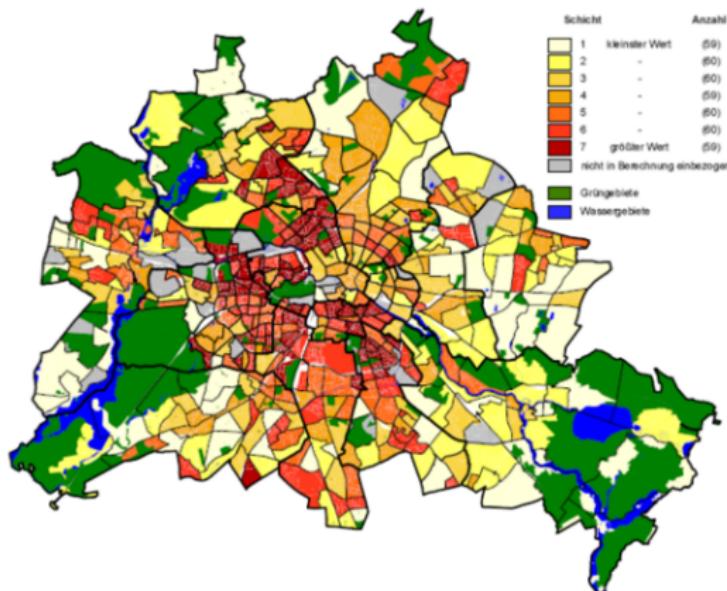
- ▶ culmination of economic/demographic/housing characteristics
- ▶ influence a community's ability to respond to, cope with, recover from, and adapt to **environmental hazards**.



http://webra.cas.sc.edu/hvri/products/sovi_42/sovi.aspx

Social indice

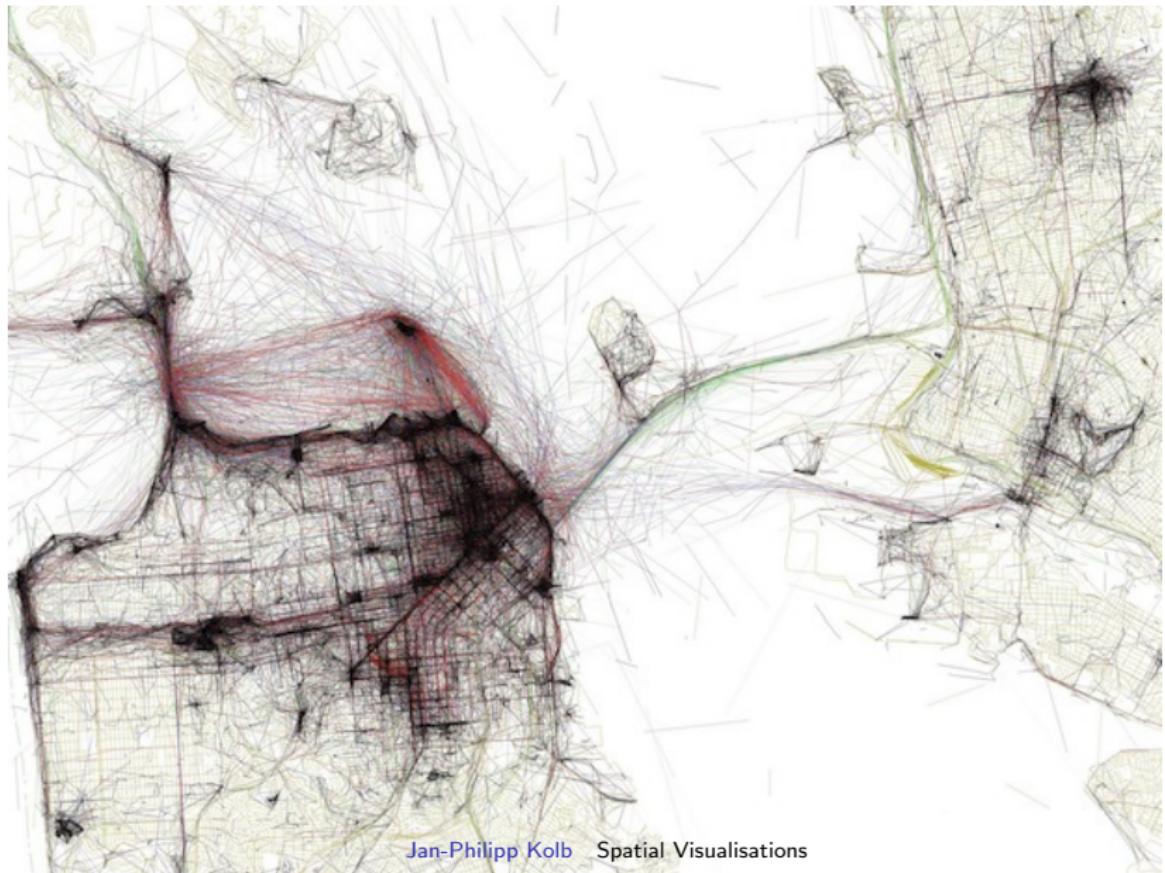
Proportion of social benefit recipients in Berlin



[http://www.tagesspiegel.de/mediacenter/fotostrecken/berlin/sozialindex-berlin/1487202.html?
p1487202=13](http://www.tagesspiegel.de/mediacenter/fotostrecken/berlin/sozialindex-berlin/1487202.html?p1487202=13)

The spatial perspective...

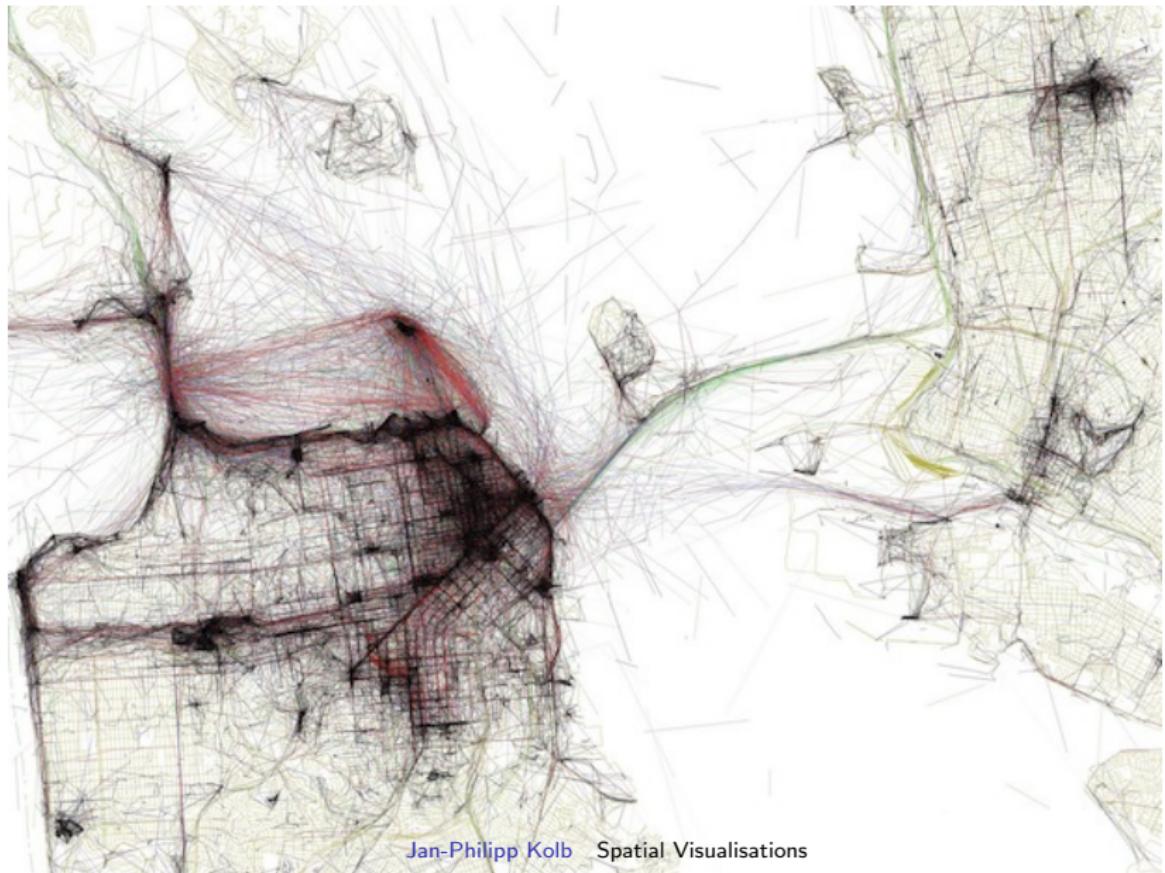
- ▶ ... is relevant to understand circumstances.



A hint



<http://de.wikipedia.org/wiki/Kalifornien>



flickr™

Spatial? - Motivation

- ▶ Massive amounts of data ... and growing!
- ▶ Often freely accessible on the web (e.g. through APIs)
- ▶ Often unstructured or semi-structured (e.g. web documents, news archives), often heterogeneous
- ▶ Often not intended for geographic purposes, but containing geographic info implicitly (Web 2.0)
- ▶ Often with little or no metadata

Targets

I want to....

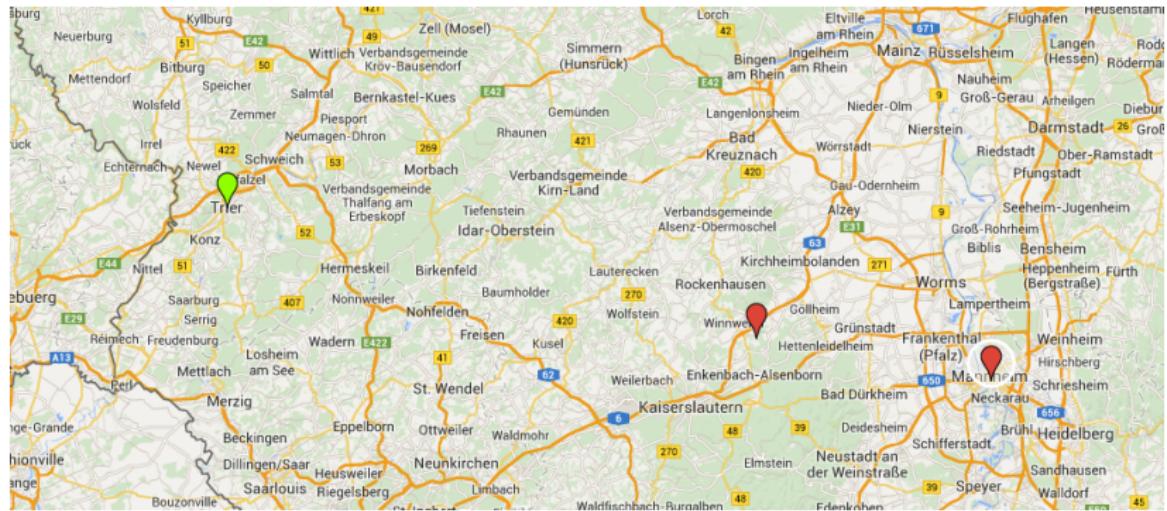
- ▶ ... show you examples of useful and less useful visualisations and applications.
- ▶ ... talk about the developments of maps/geography.
- ▶ ... clarify, why it is important for social sciences.
- ▶ ... show you how to produce your own maps/visualisations.
- ▶ ... tell you where you can find data.

Who I am?



Spatial Visualisations

Background





<http://www.uni-trier.de/index.php?id=17322>



Erasmus in Lyon

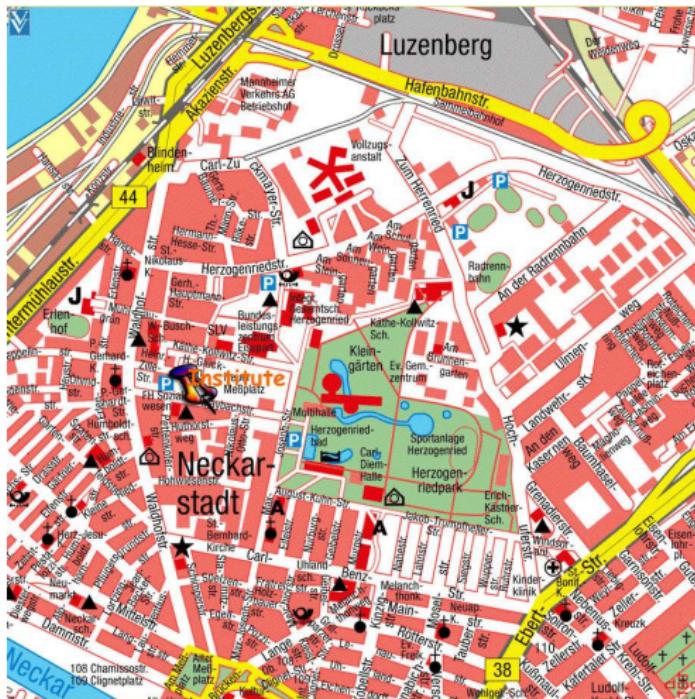


PhD in Trier



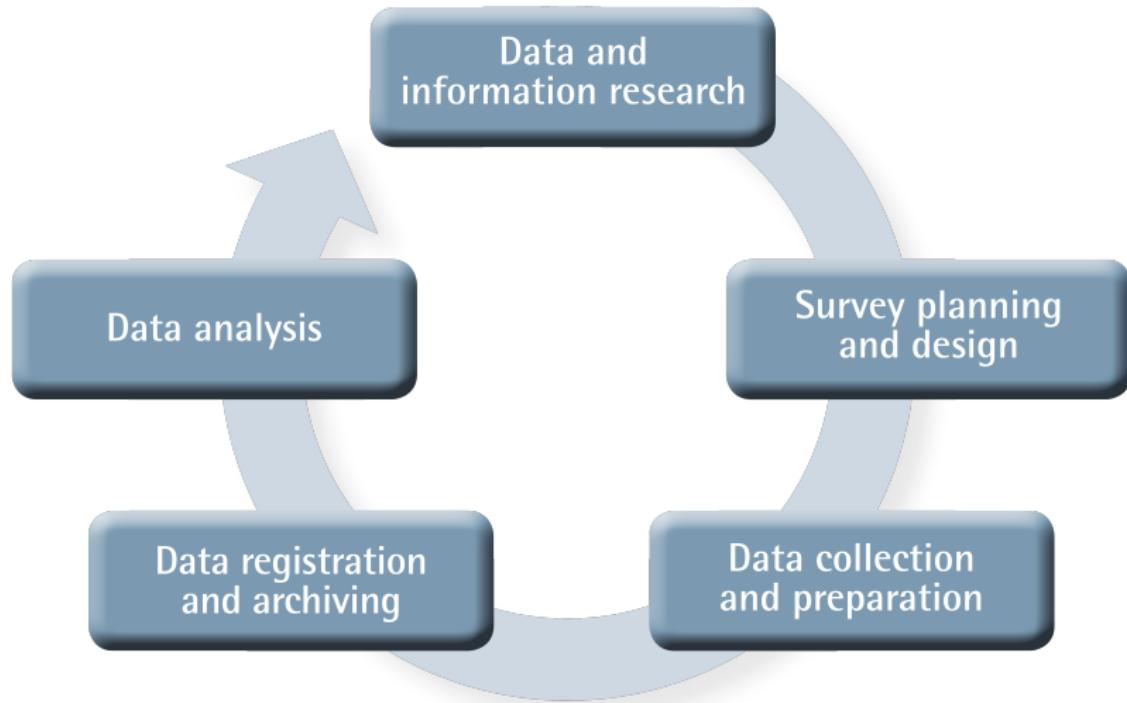
<http://www.orangesmile.com/reiseinfos/lyon/ausfuhrliche-karten.htm>

GESIS Mannheim



<http://www.orangesmile.com/reiseinfos/mannheim/ausfuhrliche-karten.htm>

Presentation of GESIS



Tasks GESIS-team statistics

Consulting and research on ...

- ▶ Planning of survey designs
- ▶ Development of sample designs for face-to-face, written, and telephone-assisted surveys
- ▶ Data analysis and visualisation

Outline

The big picture

Targets

Background

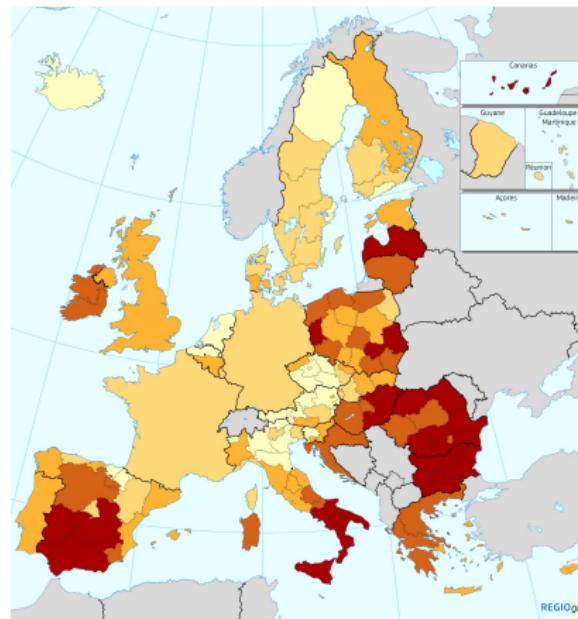
Geo use cases

Private interest

Tools

Organisation

Geo-use-case 1 - At risk of poverty rate



Population at-risk of poverty or social exclusion, 2011

percentage points

< 18.1

18.1 - 20.1

20.1 - 25.7

25.7 - 33.9

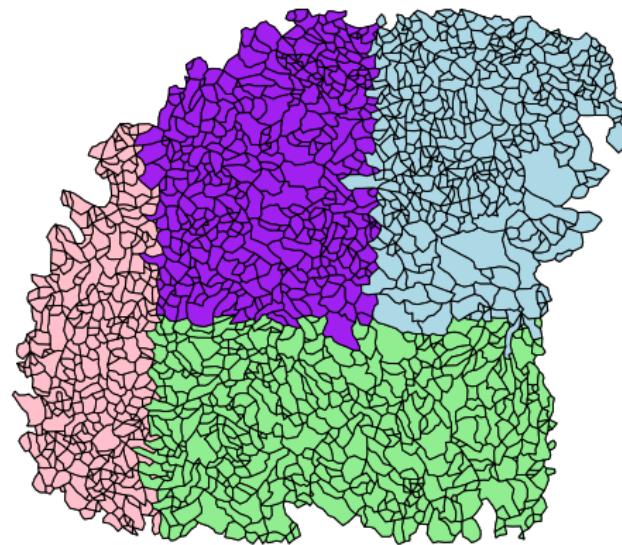
>= 33.9

EU27 = 24.2

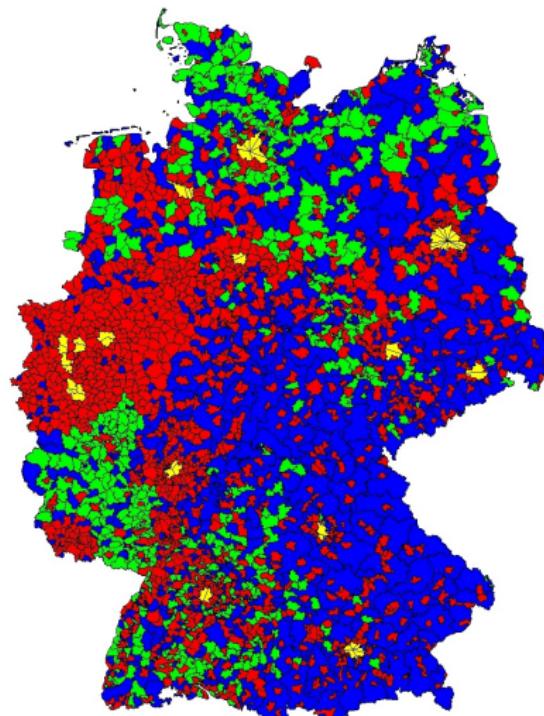
EU = 24.0

Source: Eurostat

Ameli - poverty measurement

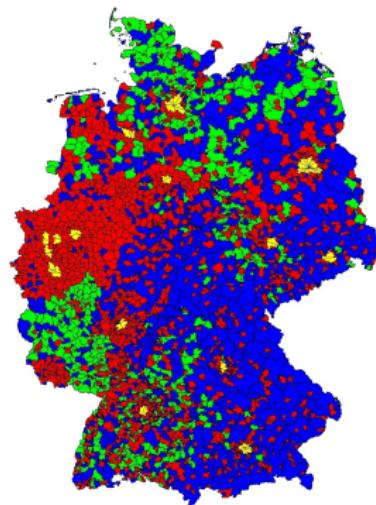


Example of map - German census



Geo-use-case 2 - Visualisation

German register-based Census 2011



SMPtypes

- ▶ Less than 10.000 inhabitants
- ▶ Less than 10.000 inhabitants
- ▶ More than 10.000 inhabitants
- ▶ More than 400.000 inhabitants

Source: Mnich, Gabler et al. (2012): Stichprobenoptimierung und Schtzung im Zensus 2011

Private Interest

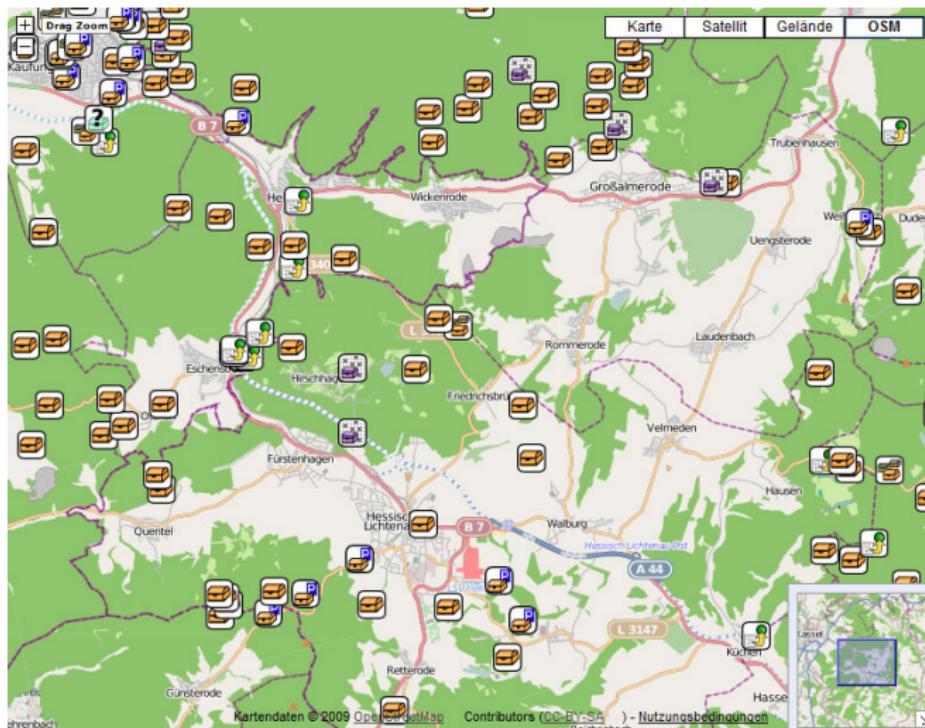


Private Interest - biking

The screenshot shows the bikemap.net website interface. At the top, there's a header with the logo, search bar, and navigation links like 'ROUTE FINDEN', 'ROUTE ANLEGEN', 'App', 'FAQs', and 'Mein'. Below the header is a search bar for 'Routen von Usen' and 'Offizielle Routen'. The main area features a map of Mannheim with yellow lines representing cycling routes. A central modal window displays a route summary: 'Routenlänge: 0 km - 500+ km', with icons for 'Anreise', 'Abreise', and 'Ankunft'. It also includes a 'Premium-Routen anzeigen' checkbox and a 'zeige mehr' button. To the right, a 'Willkommen!' section highlights the collection of 1325.277 routes with a total length of 126.077.782 km. It encourages users to register for a personal route collection and provides links to the Facebook page and User-Forum. On the far right, there are sections for 'Neue Routen' and 'Top Routen in Karte', listing routes like 'MTB 01 SHIESTERO BALCONIE' (332 m, 1.500 km), 'BC Tag 5' (85 km), 'Enduro Točná Trail na Kanadu II' (8 km), 'GUANGYUAN - DALU' (2.500 km), 'BC Tag 4' (100 km), and 'Pelos Vales' (20 km). The bottom left corner has a 'www.bikemap.net/de' link and social media icons.

<http://www.bikemap.net>

Private Interest - geocaching



Private Interest - collect informations

yelp Find tacos Near Los Angeles, CA Sign Up Log In

tacos Los Angeles, CA Showing 1-10 of 16032

Hide Filters ▾

Sort By	Neighborhoods	Distance	Price	Features	Category
Best Match	<input type="checkbox"/> Downtown	Bird's-eye View	<input type="checkbox"/> \$	<input type="checkbox"/> Offering a Deal	<input type="checkbox"/> Mexican
Highest Rated	<input type="checkbox"/> Boyle Heights	Driving (5 mi.)	<input type="checkbox"/> \$\$	<input type="checkbox"/> Open Now 3:05 PM	<input type="checkbox"/> Food
Most Reviewed	<input type="checkbox"/> Pasadena	Biking (2 mi.)	<input type="checkbox"/> \$\$\$	<input type="checkbox"/> Take-out	<input type="checkbox"/> Fast Food
	<input type="checkbox"/> East Los Angeles	Walking (1 mi.)	<input type="checkbox"/> \$\$\$\$	<input type="checkbox"/> Good for Kids	<input type="checkbox"/> Food Stands
	More Neighborhoods	Within 4 blocks			More Categories

Taco Bell Ad Mexican, Fast Food, Tex-Mex Mid-City 1601 Crenshaw Blvd, Los Angeles, CA 90019 (323) 735-7702

This review is not for the restaurant, but for the newly introduced Kentucky Grilled Chicken. The restaurant this review is under is the location where I tried my first KGC, but I wouldn't...

1. Gusados 4.5 1278 reviews Boyle Heights 2100 E Cesar Chavez Ave, Los Angeles, CA 90033 (323) 254-7201

Got the sampler tacos which was a good deal. All the meats were stewed which was a bit of a disappointment. I added the chile taco which was a very bad idea - hottest thing I have ever eaten...

2. El Chato Taco Truck 4.5 682 reviews Mid-Wilshire 5300 W Olympic Blvd, Los Angeles, CA 90019 (323) 202-6936

Ultimate favorite taco truck! Tacos go for \$1 each and they may be small but these small bite-sized delights are full of flavor! One bite and it's game over, you'll be like damn, I've finally...

A map of Los Angeles with several red pins indicating the locations of taco places. Labels on the map include Sun Valley, La Crescenta, Montrose, Van Nuys, Sherman Oaks, Northridge, Glendale, Pasadena, Beverly Hills, Santa Monica, Marina del Rey, Venice, Westwood, Culver City, Inglewood, Hawthorne, Lawndale, Gardena, Torrance, and Lynwood.

More Map Redo search when map moved

Ads by Google related to: tacos Los Angeles

Taco Trucks La
www.yelp.com/Taco+Trucks+La
Search for Taco Trucks La Look Up Quick Results Now!

Love to Run the Beach?
www.startly.com
Surf Sand and Fun Run Highway 1

<http://www.yelp.com>

Who are you?

Your background?

- ▶ Where do you come from?
- ▶ What are you studying?
- ▶ Do you have ideas for spatial visualisations?

Outline

The big picture

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GIS

A geographic information system (GIS) is a computer system designed to capture, store, manipulate, analyze, manage, and present all types of spatial or geographical data.

http://en.wikipedia.org/wiki/Geographic_information_system

Commercial GIS



⇒ good software but quite expensive

Tools

Online-GIS

Google Maps/Google Earth, Bing Maps, HERE, YandexMaps and OpenStreetMap



Open-Source-GIS

GRASS GIS, QGIS, and DIVA-GIS.





R and the geographic information systems

- ▶  and QGIS

<http://decisionstats.com/2011/02/14/qgis-and-r/>

- ▶  and GRASS GIS

http://grasswiki.osgeo.org/wiki/R_statistics

- ▶  and DIVA GIS

<http://cran.r-project.org/web/packages/divagis/index.html>

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Steps

- ▶ Show examples for spatial visualisations
- ▶ Clarify different types of maps
- ▶ Explain the theoretic foundations
- ▶ Show data sources
- ▶ Show how to create own maps

Division into three

Every session will be divided into three parts:

1. Lecture
2. Applied R-session
3. Assisted try out

Target: Every participant should present his/her own map.

- ▶ Presentation of toolbox (R, Google API, OpenStreetMap etc.)
- ▶ Learning by doing is very important

Outline - Monday 13 October 2014

Lecture

- ▶ Introduction
- ▶ Background
- ▶ Motivation
- ▶ Organisation

R-session

- ▶ Why use R?
- ▶ Introduction to R

Outline - Monday 20. October 2014

Lecture - Map types

- ▶ Good examples - bad examples
- ▶ examples in newspapers, websites, books, articles ...
- ▶ Development of mapping - from historic maps to modern mashups

R-session - Choropleths

- ▶ Download information from GADM
- ▶ Visualization - Choropleths
- ▶ The maptools package

Outline - Monday 27. October 2014

Lecture - Neogeography

- ▶ Interesting projects OpenStreetMap, mapping Wikipedia / Flickr
- ▶ Application programming interface (API)
- ▶ Geolocation/ Representation of Coordinates/ Latitude and Longitude
- ▶ Geocoding/geotagging (Example of a map)
- ▶ Easy-to-use mapping tools

R-session - Usage of APIs

- ▶ Data through APIs
- ▶ The googleMaps/ osmar/ ggmap package

Outline - Monday 03. October 2014

Lecture - advanced spatial visualizations

- ▶ Rich blocks poor blocks
- ▶ Heat maps/ Dot density maps
- ▶ One dot per person/Every River/ Flight patterns
- ▶ Examples Flickr
- ▶ Visualizations of distances
- ▶ Where people run (Spatial-time data)

R-session - advanced spatial visualizations with R

- ▶ The sp package
- ▶ Color coding
- ▶ Dot maps/heat maps

Outline - Monday 10. November 2014

Lecture - More Data Sources/ Further Reading

- ▶ New developments Web 2.0
- ▶ Terra Incognita
- ▶ Visualizing.org
- ▶ Nasa World Wind
- ▶ Emotional Map
- ▶ Geo Blog

R-session - Data processing

- ▶ How to integrate symbols in visualizations
- ▶ How to use maps as background for visualization
- ▶ The raster package

Outline - Monday 17./24. November 2014

- ▶ 20 minutes presentation
- ▶ 10 minutes discussion