

„Presentation and Analysis of Spatial Data“

(1) Spatial Research Questions in the Social Sciences

Thomas Wöhler, Universität Konstanz
Kiev, October, 2016



Agenda

- **Program of the Workshop**
- **Space as Kategorie in the Social Sciences**
- **Problems with the Analysis of Spatial Data**
- **A „Brave new world“ of Spatial Data**
- **Potentials**
- **Software**

Program

Workshop

„Presentation and Analysis of Spatial Data“

Dr. Thomas Wöhler, Uni Konstanz

Agenda

Day 1. 05/10/2016

9:00-10:20 Session 1

Space and the Social Sciences

10:30-11:50 Session 2

Spatial Data

12:10 - 13:30 Session 3

Presentation of Spatial Data and Spatial Relationships

Day 2. 06/10/2016

10:30-11:50 Session 4

Working with Spatial Data

12:10 - 13:30 Session 5

Analysis of Spatial Patterns (Moran's I, Analysis of Residuals)

Program

Day 3. 07/10/2016

10:30-11:50 Session 6

Spatial Regression

12:10 - 13:30 Session 7

Spatial Conditional Effects (Geographically Weighted Regression)

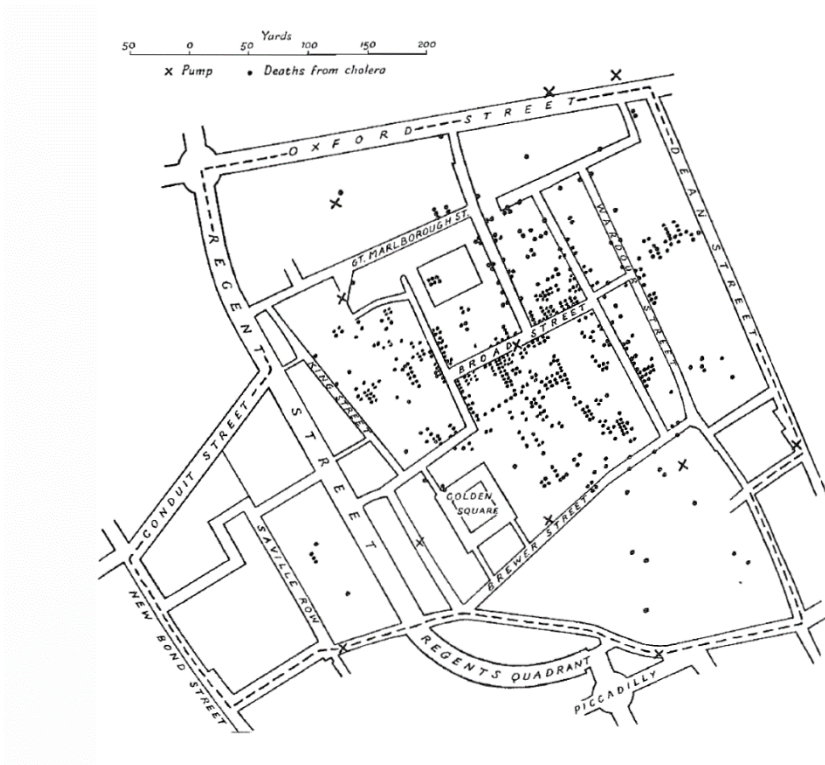
Days 4-5. 10-11/10/2016

10:30-13:50 (Session 8/9)

Optional: Working on spatial data under supervision

Space as Categorie in the Social Sciences

The Ghost Map (John Snow 1855)



each dot corresponds to one death of cholera

Space as Categorie in the Social Sciences

The Ghost Map (John Snow 1855)



each dot corresponds to one death of cholera

★: Water pump

Space as Kategorie in the Social Sciences

Examples

- Are students who live close to each other more likely to form friendships?
- Does the correlation between share of foreigners and voting share of far-right parties varies with geographic location?
- Is residential segregation for specific groups of foreigners higher, in specific cities higher?
- Is there social inequality with regard to pollution?
- Regional variance of fertility
- Neighborhood effects on school performance / health / ...
- Conflict in New York City

Space as Kategorie in the Social Sciences

Why Space?

Space as Kategorie in the Social Sciences

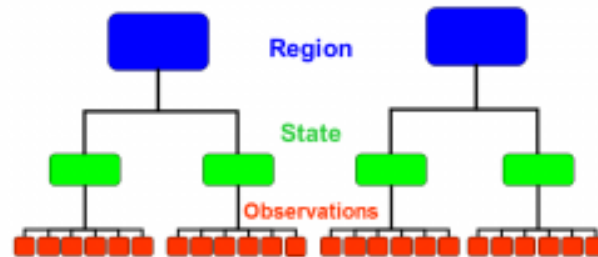
Why Space?

- Space as framework / context for social action:
 - through distance
 - through institutions
 - through infrastructure
 - through social context
 - through built environment
 - ...
- Space as proxy:
 - for differences in socialization
 - for differences in lifestyle
 - ...

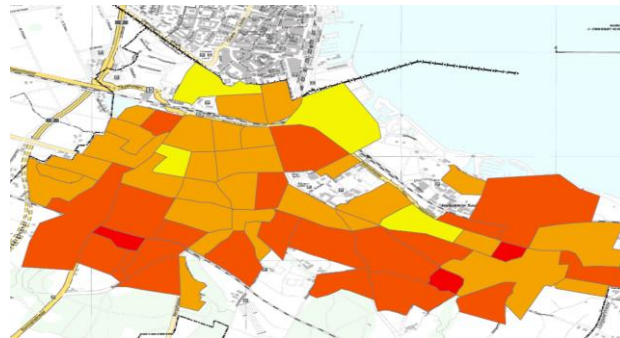
Problems with the Analysis of Spatial Data

1. Inclusion of spatial position with independent variables

2. Multilevel models



3. Indicators of spatial relations (e.g. Segregation)

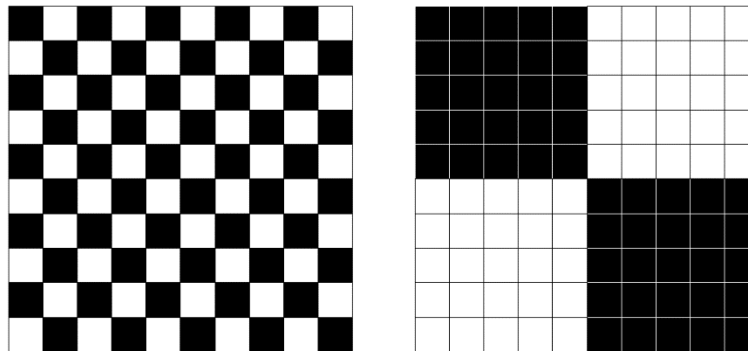


Problems with the Analysis of Spatial Data

1. The Modifiable Areal Unit Problem (MAUP):

1. Scaling effects
2. Zoning effects

2. The checkerboard-problem

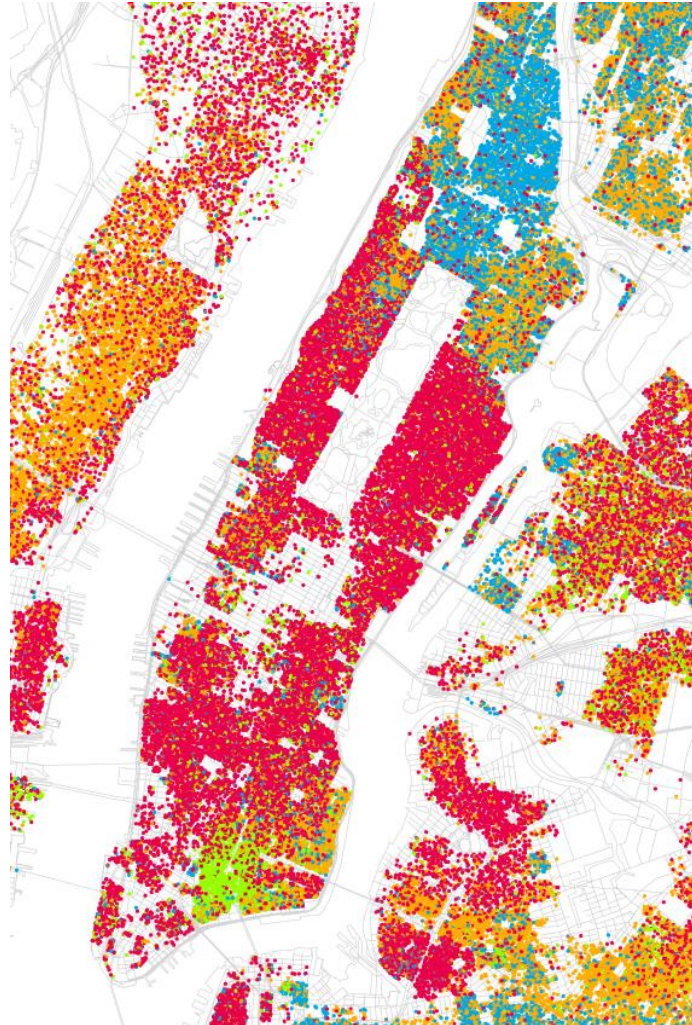


3. Spatial autocorrelation

New possibilities

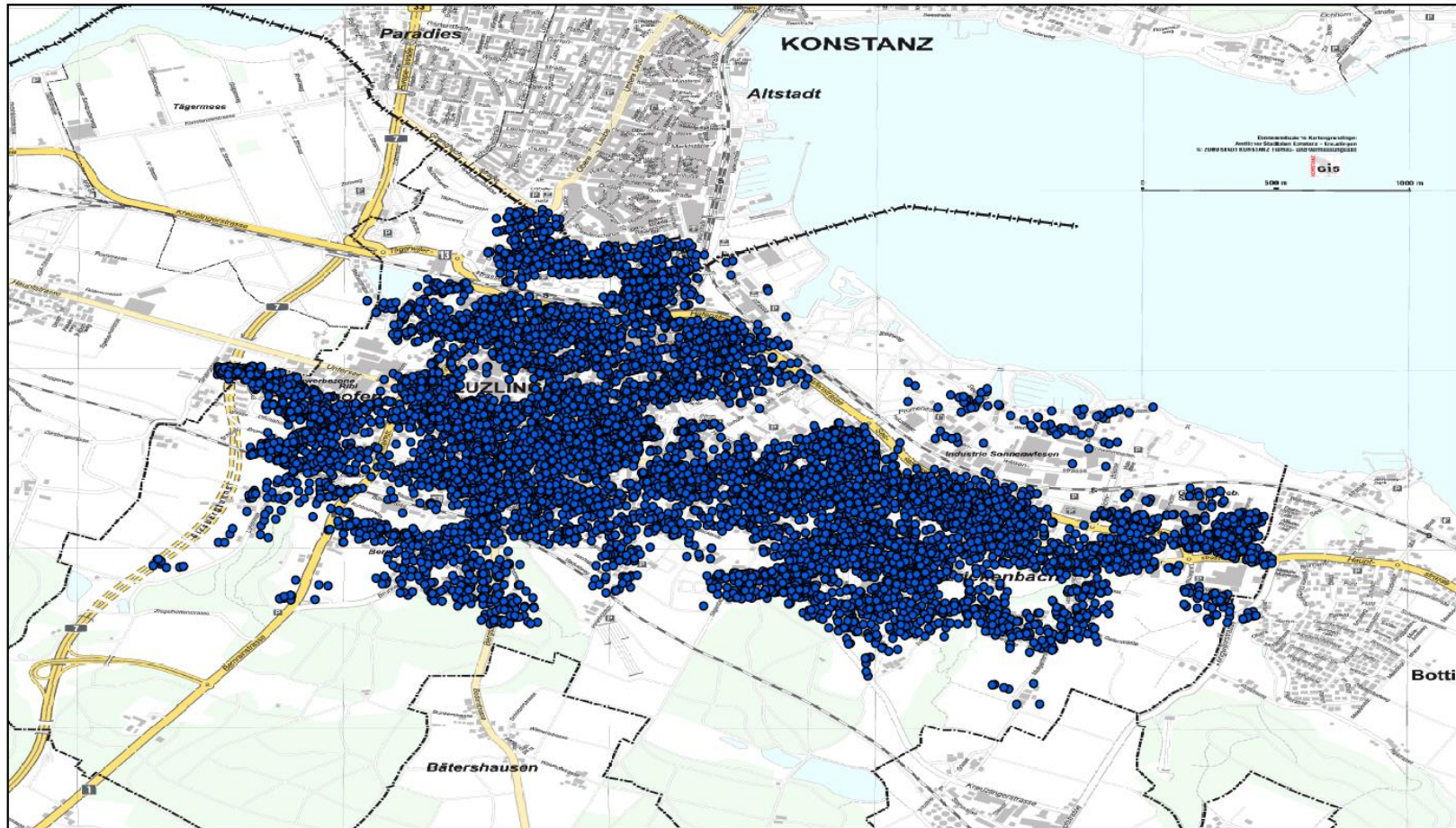


New possibilities



Eric Fisher (flickr)

New possibilities



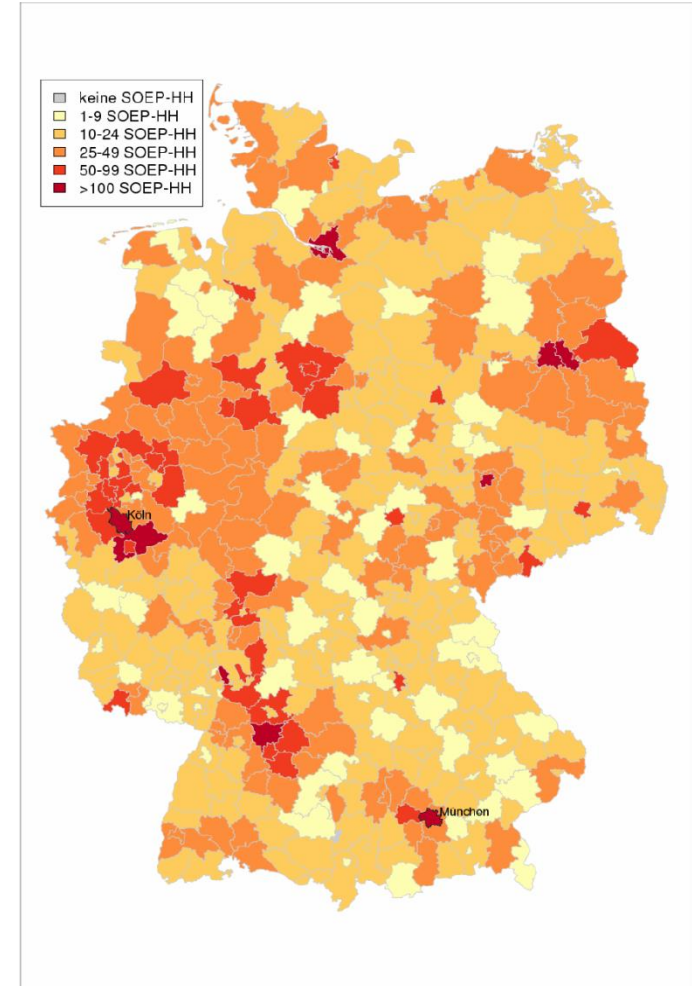
"Digitalisierte Grundrißdaten der amtlichen Flurkarte des
Tiefbau- und Vermessungsamtes der Stadt Konstanz
Stand 05.07.2010"

Einwohner aus der Schweiz (2010)

New possibilities: German Socio-Economic Panel

- Individual Context-data for the waves from 2002
- No arbitrary aggregation needed any more
- More efforts to preserve anonymity needed

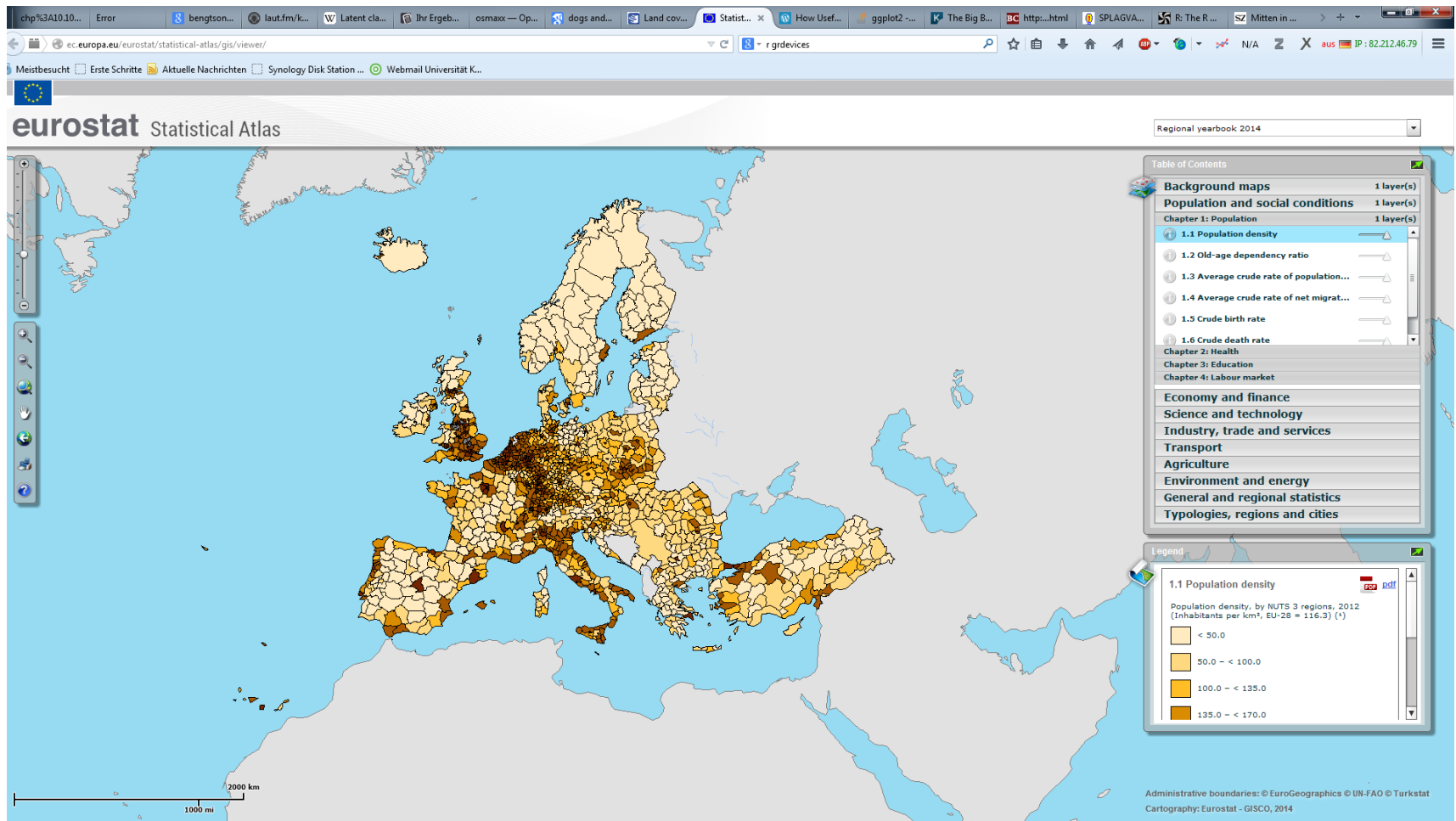
Die Verteilung der SOEP-Haushalte in Deutschland (Gebietsstand 31.12.2000)



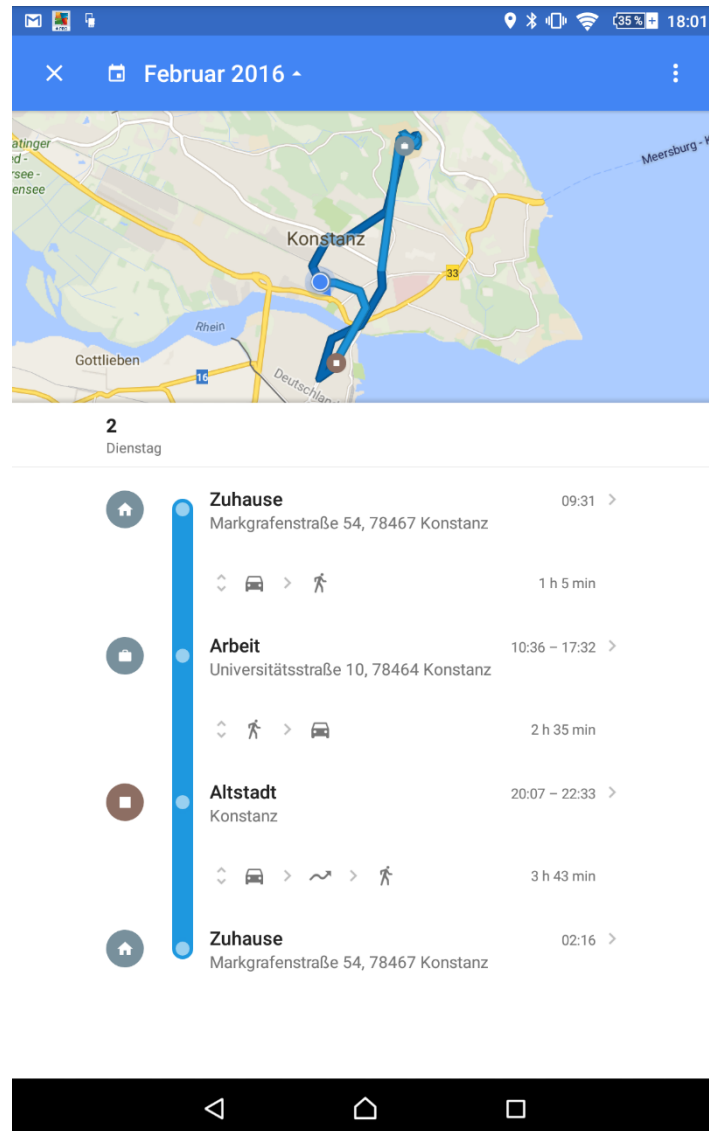
New possibilities: ZENSUS 2011




New possibilities: EUROSTAT



New possibilities: Smartphones and Google




New possibilities: www.walkscore.com

Walk Score  Get Scores Find Apartments My Favorites Add to Your Site

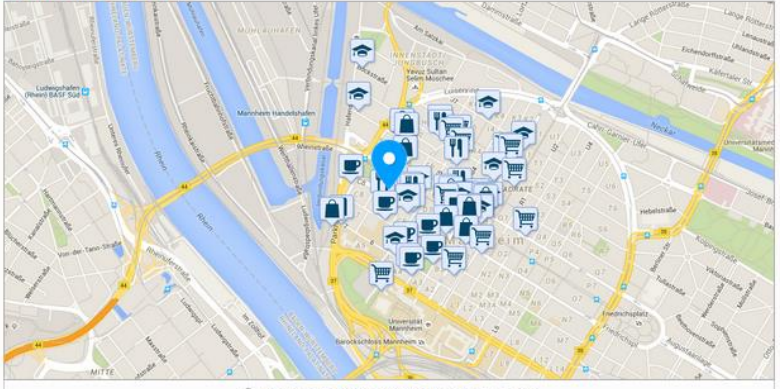
Type an address, neighborhood or city


Walker's Paradise

A location in Mannheim

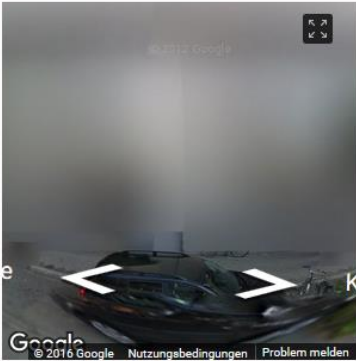
Walk Score
93
Daily errands do not require a car.
 Unsupported Country

[About your score](#)
[Add scores to your site](#)



 Show a Walk Score map on your site

About this Location





This location has a Walk Score of 93 out of 100. This location is a Walker's Paradise so daily errands do not require a car.


Nearby parks include Neckarufer Neckarstadt-West, Grimminger GmbH and Die Gartenprofis.



Travel Time Map [Add to your site](#)

Explore how far you can travel by car, bus, bike and foot from this location.




 20 Min



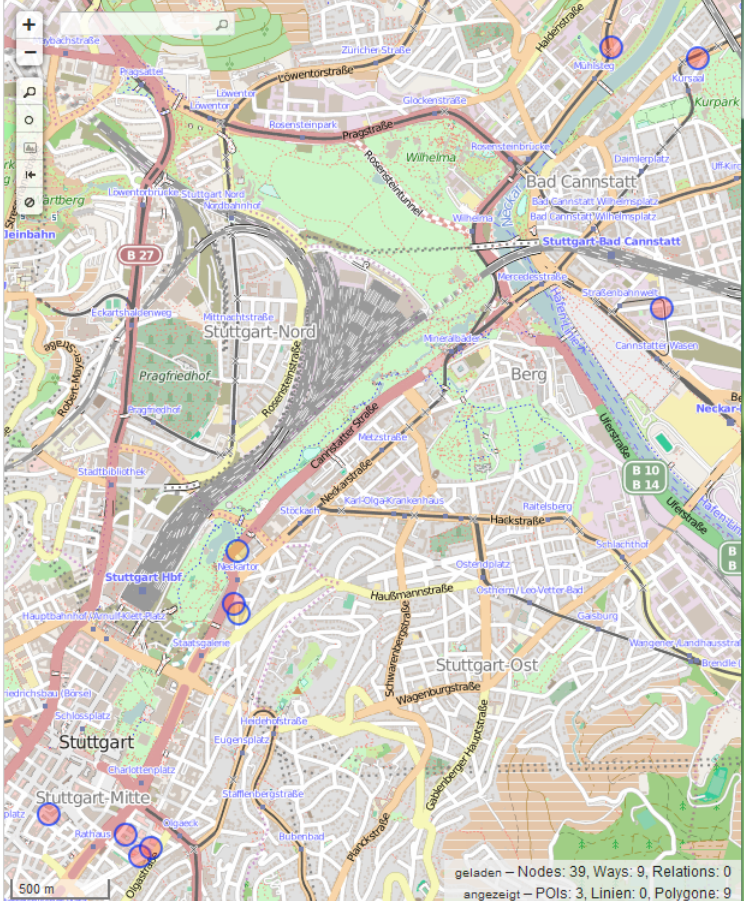
 

© OpenStreetMap contributors
Kartendaten © 2016 GeoBasis-DE/BKG (©2009), Google Nutzungsbedingungen Fehler bei Google Maps melden

New possibilities: OPENSTREETMAP

Ausführen Teilen Export Wizard Speichern Laden Einstellungen Hilfe overpass turbo  Karte Daten

```
1  /*
2  This has been generated by the overpass-turbo wizard.
3  The original search was:
4  "amenity=brothel in stuttgart"
5  */
6  [out:json][timeout:25];
7  // fetch area "stuttgart" to search in
8  ((geocodeArea:stuttgart)->.searchArea;
9  // gather results
10 (
11  // query part for: "amenity=brothel"
12  node["amenity"="brothel"](area.searchArea);
13  way["amenity"="brothel"](area.searchArea);
14  relation["amenity"="brothel"](area.searchArea);
15 );
16 // print results
17 out body;
18 >;
19 out skel qt;
```



geladen - Nodes: 39, Ways: 9, Relations: 0
angezeigt - POIs: 3, Linien: 0, Polygone: 9

New possibilities: Crime mapping (USA)

The screenshot displays the CRIME MAPPING website interface. At the top, there is a navigation bar with links for "Contact", "Help", "About", and "The Omega Group". The main header features the "CRIME MAPPING" logo with the tagline "Building Safer Communities" and a search bar with the placeholder text "Enter an address:". To the right of the search bar is a "RECEIVE CRIME ALERTS" button. Below the header, there is a navigation menu with tabs for "Crime Types", "Dates", "Address", and "Agencies". A "Version 5.2" label is also present. The main content area shows a map of the United States with numerous blue pins indicating crime locations. A tooltip above the map indicates "236 agencies" and provides instructions: "Click a blue pin () and zoom in to view crime." The map includes a legend for "CLICK then DRAG" and a "Map" button. The map is powered by Esri, as indicated by the logo in the bottom right corner.

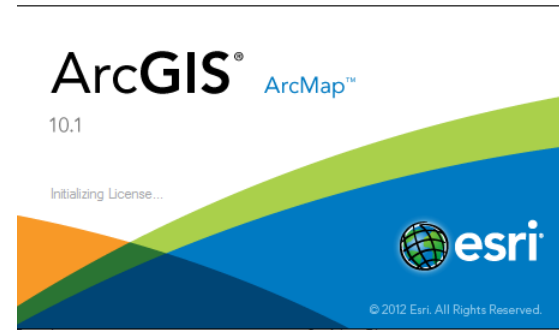
New possibilities: Residential property

The screenshot shows a web browser window displaying a GIS application. The address bar shows www.thurgis.tg.ch/mapbender/frames/index.php. The page title is "Eigentumsinformation" and the URL is www.thurgis.tg.ch. The map shows a residential area with a highlighted parcel in red. A detailed information window is open, showing the following data:

Gemeinde	
Politische Gemeinde:	Kreuzlingen
BFS-Nummer:	4671
Ortschaft:	8280 Kreuzlingen
Liegenschaft	
Parzellennummer:	1095
Exportdatum:	28.04.2011
Qualität:	AV93
Eigentümerinformationen	
Eigentümer	
Peter Felber, Bündtweg 10, 8280 Kreuzlingen	
Grundbuch Kreuzlingen	
Liegenschaft Nr. 1095	
Plan Nr. 1, Kreuzlingen	
1'347 m ² Wohn- Geschäftshaus Assek.Nr. 39.5.91, Konstanzerstrasse 5 [569 m ²]	
übrige befestigte Fläche [778 m ²]	
Dieser Auszug kann nicht als gültiger Grundbuchauszug verwendet werden.	
16.06.2011	

Below the map, there is a legend and a search bar labeled "Suche". The Thurgau logo is visible in the top right corner of the application interface.

New possibilities: Tools



Potentials for the Social Sciences

The potential of better illustrations.

The potential of new data (more detailed and more objective).

The potential of more adequate statistical analyses.

The potential of new research questions.

On the spatial dimension of social processes. On mobility. On processes of diffusion. On the differences between objective and subjective live conditions.

...

„Hands-on“ 1: GIS

GIS stands for Geografic Information-System

Aufgaben eines GIS-Programms:

- Organisation of Geodata
- Creation of spatial units
- Geocoding
- Relate spatial units to each other (distance, surrounding, lies-within)
- Cartography
- spatial statistics

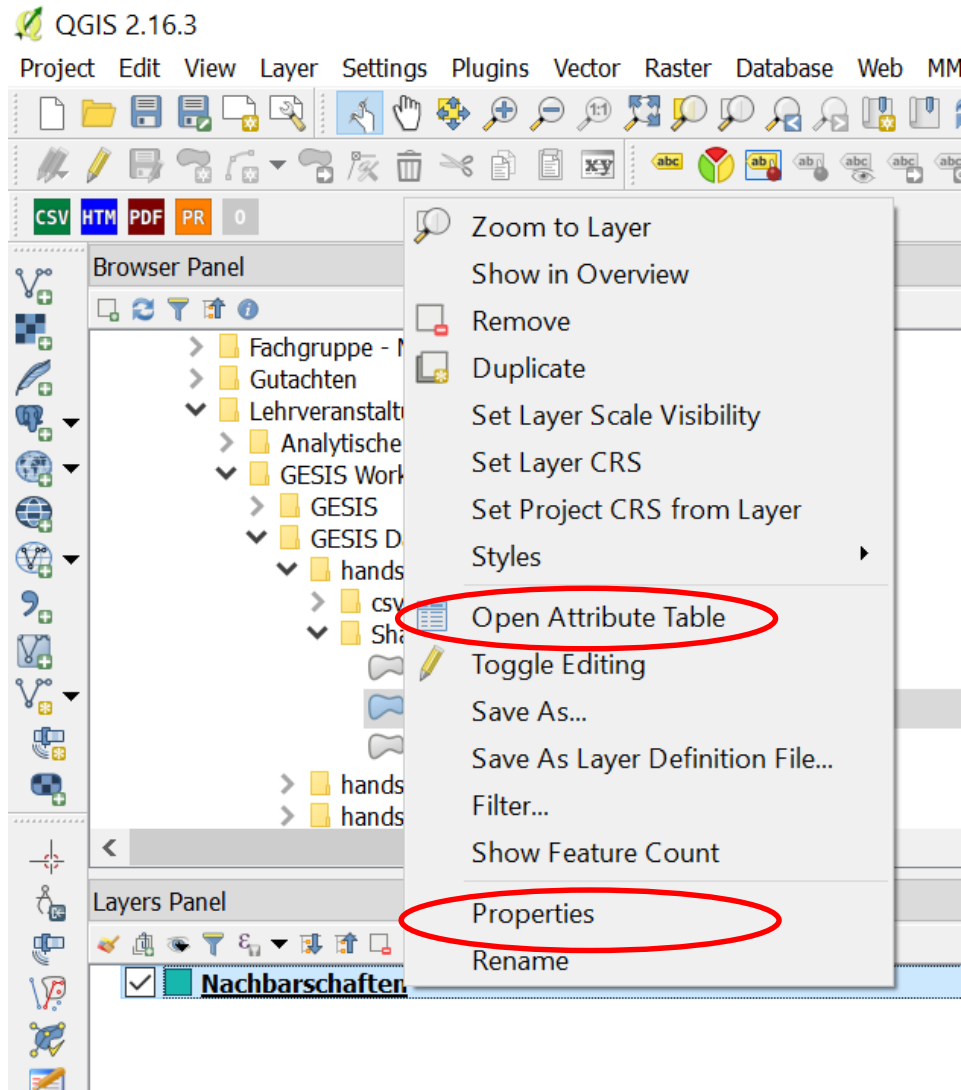
Ressources:

- <http://www.qgistutorials.com/>
- Google
- gis.stackexchange.com

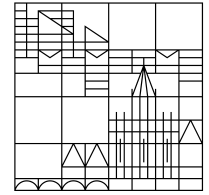
„Hands-on“ 1: GIS

- Start QGIS on your computer
- Overview of the GUI
- Installation of extensions (TableManager, OpenLayers, XY-Tools)
- Find data for exercises (add as favorite)
- Import data as layer
- Add Base-Map

„Hands-on“ 1: GIS



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Thank You
For Your Attention!

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