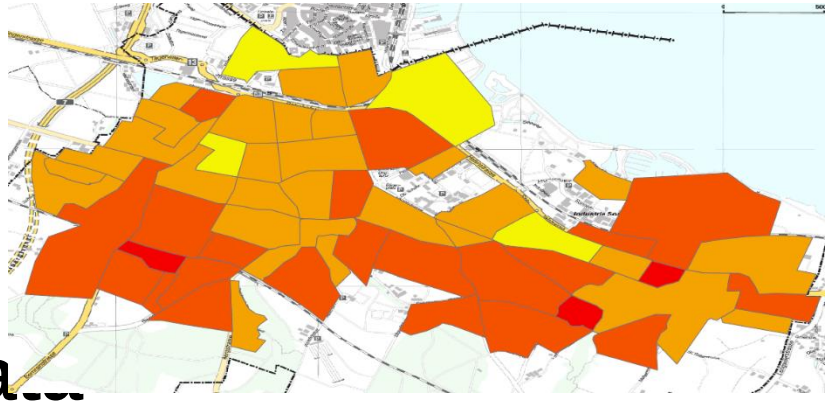
Universität Konstanz

„Presentation and Analysis of Spatial Data“



(3) Presentation of Spatial Data and Relationships

Thomas Wöhler, Universität Konstanz

Kiev, October, 2016

Agenda

- Types of presentations
- Principles of cartographic presentation
- „Hands-on“: Presentation of spatial data

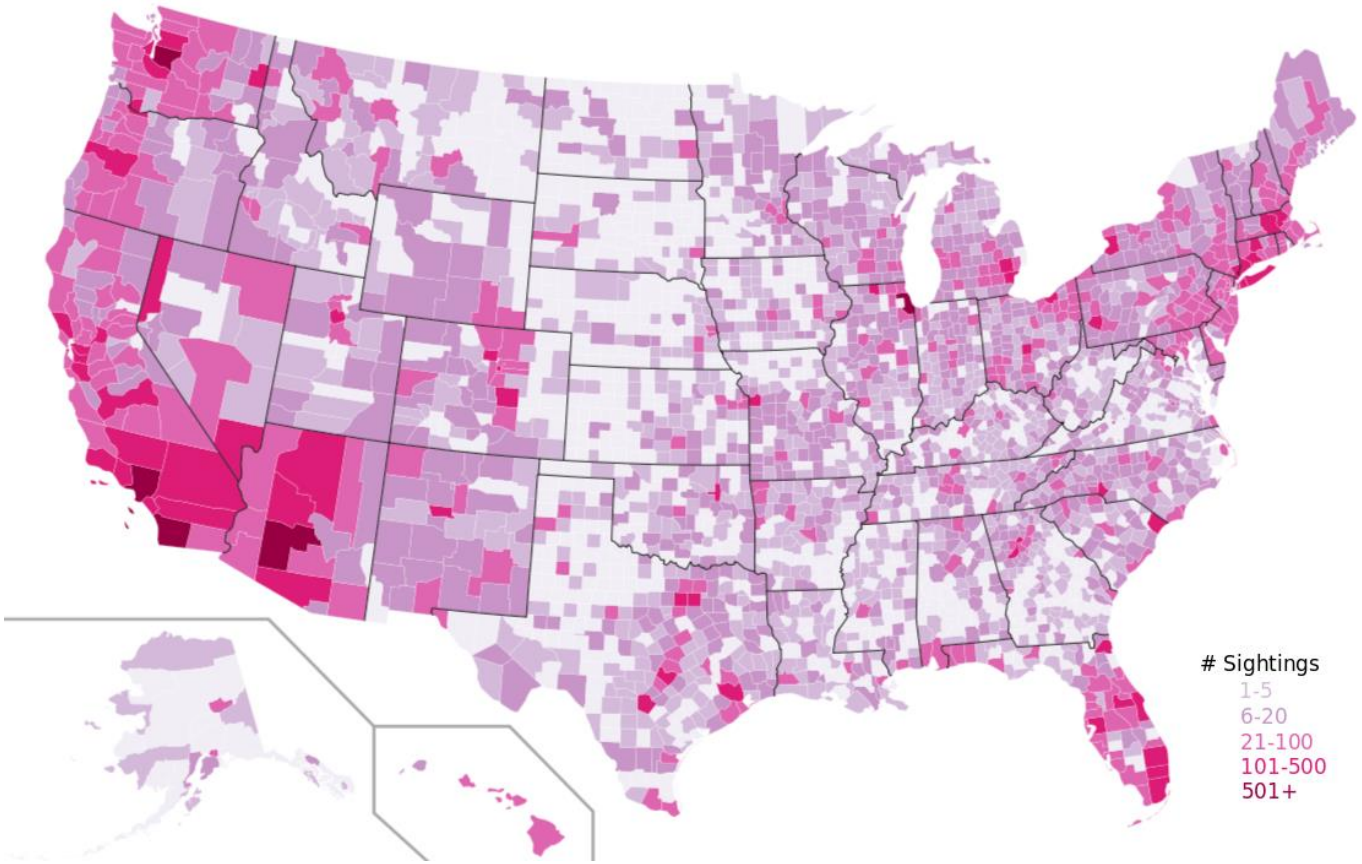
Types of presentations

- Map to present spatial data (univariate-spatial)

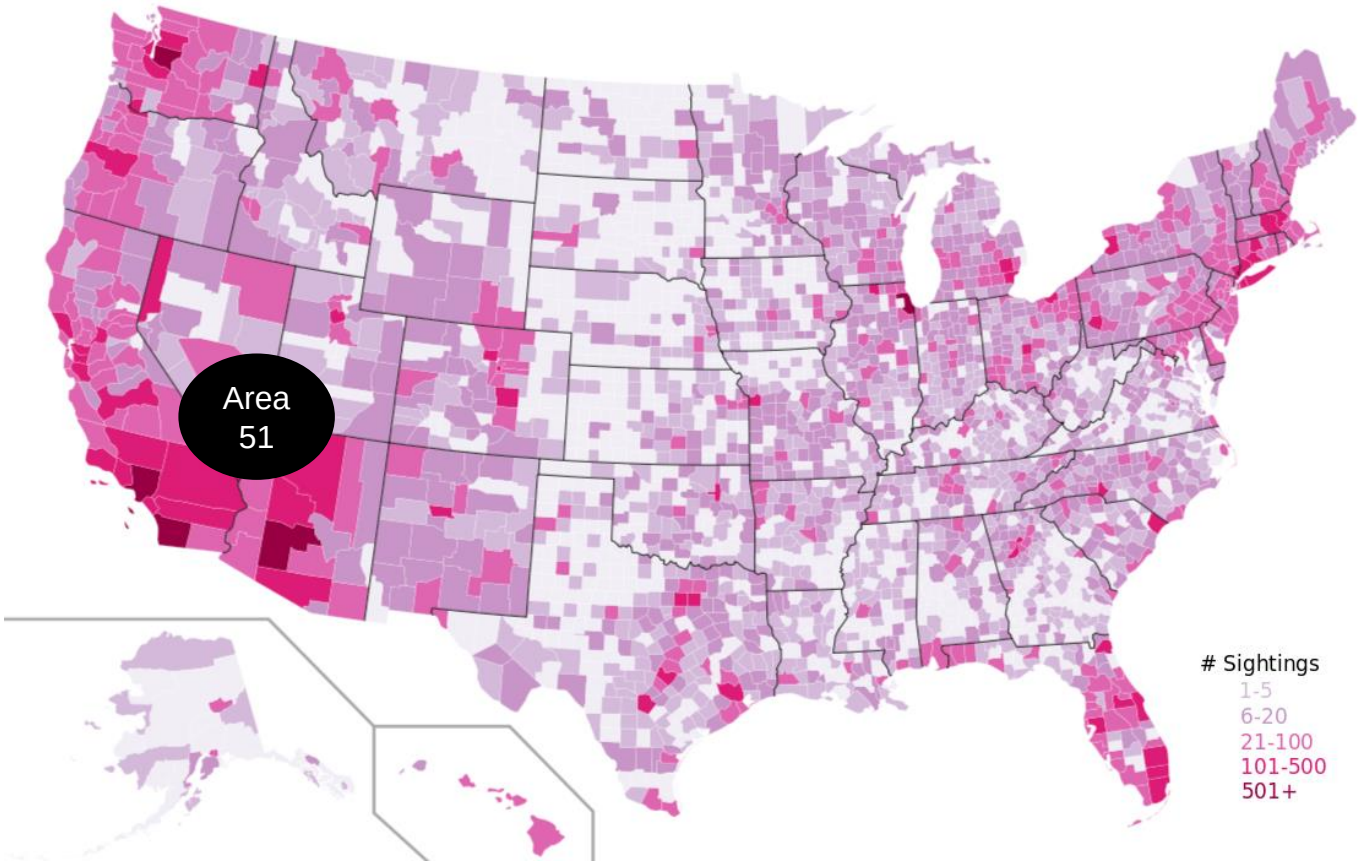
Types of presentations

- Map to present spatial data (univariate-spatial)
- Map to present spatial relationships (bivariate-spatial)

UFO

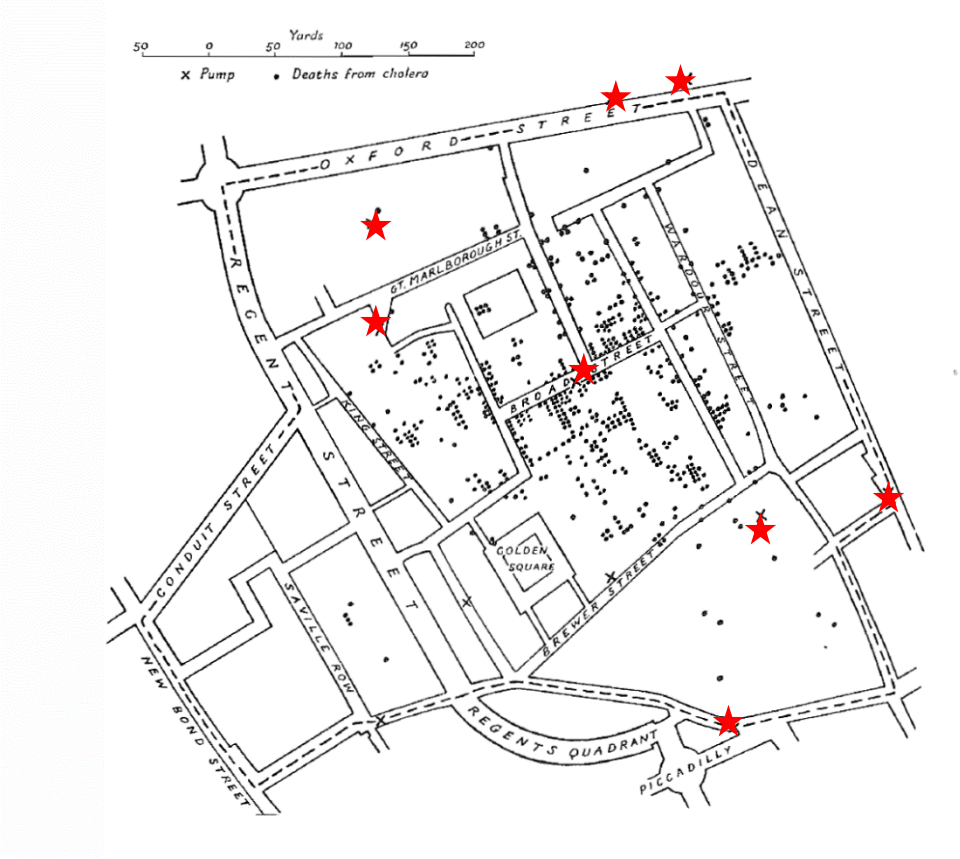


UFO – Cause?



The Ghost Map (John Snow 1855)

The Ghost Map (John Snow 1855)

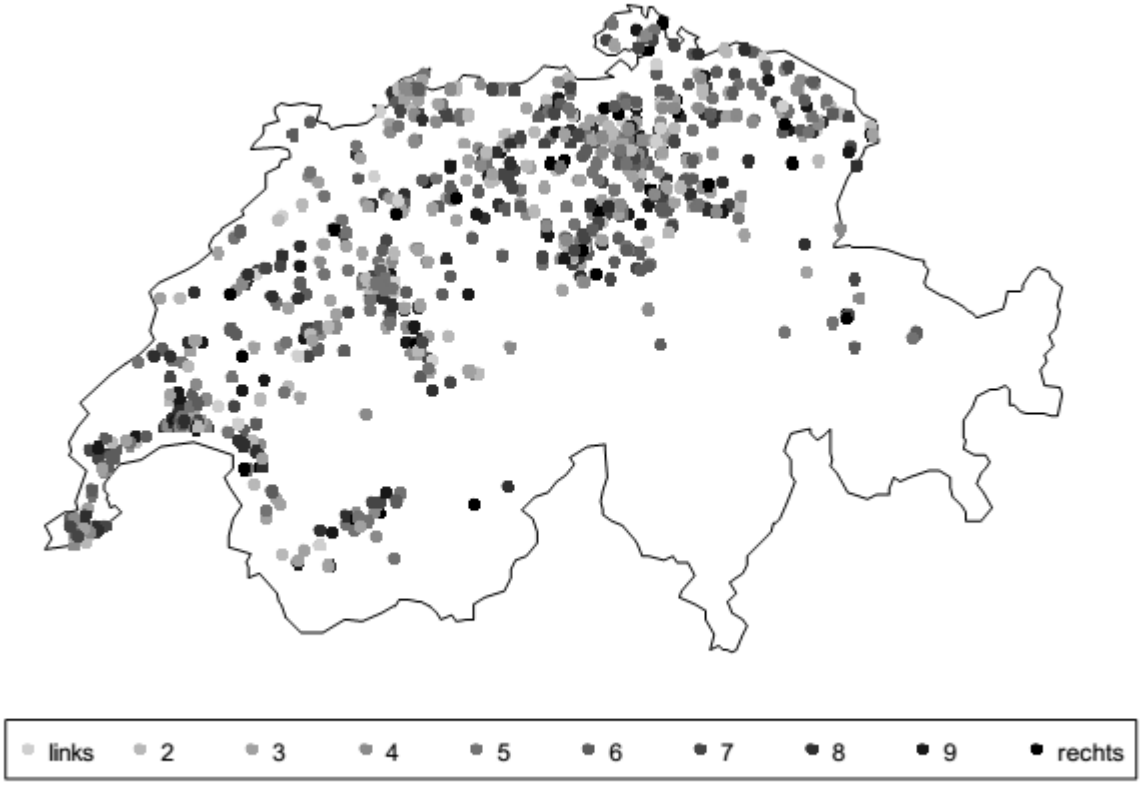


Types of presentation

- Map to present spatial data (univariate-spatial)
- Map to present spatial relationships (bivariate-spatial)
- Maps for the presentation of the results of statistical models
- (Maps for the fieldwork of surveys)

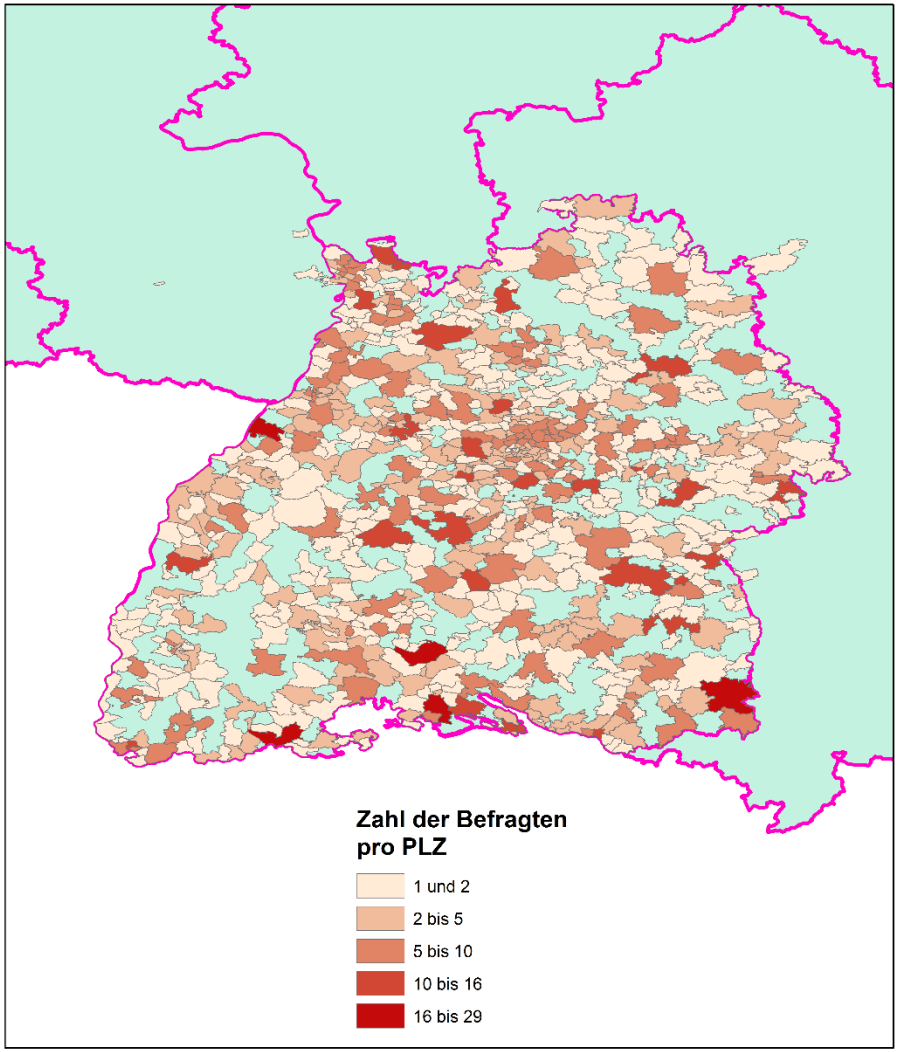
Maps for the presentation of the results of statistical models

Abbildung 7. Räumliche Verteilung der politischen Einstellung in der Schweiz, basierend auf einer Selbsteinstufungs-Skala von 1 „links“ bis 10 „rechts“. Jeder Punkt stellt den genauen Wohnort der antwortenden Person dar.



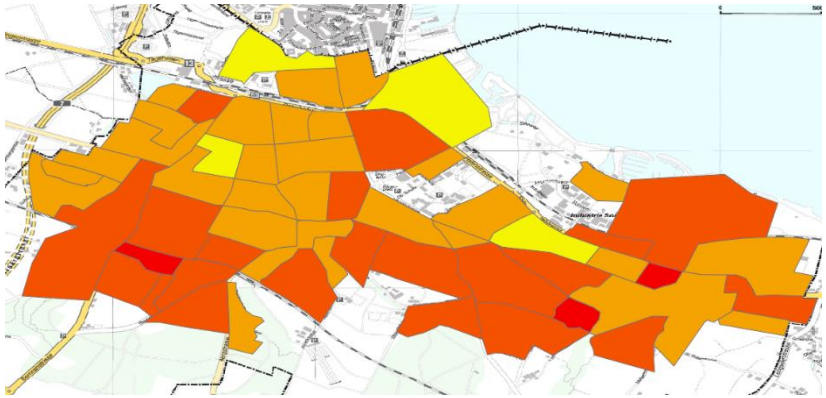
Anmerkung: Erstellt auf Basis des Datensatzes „Gruppenspezifische Einstellungen zur Zuwanderung in der Schweiz“ (2014); N=1016.

Good spatial distribution of respondents?



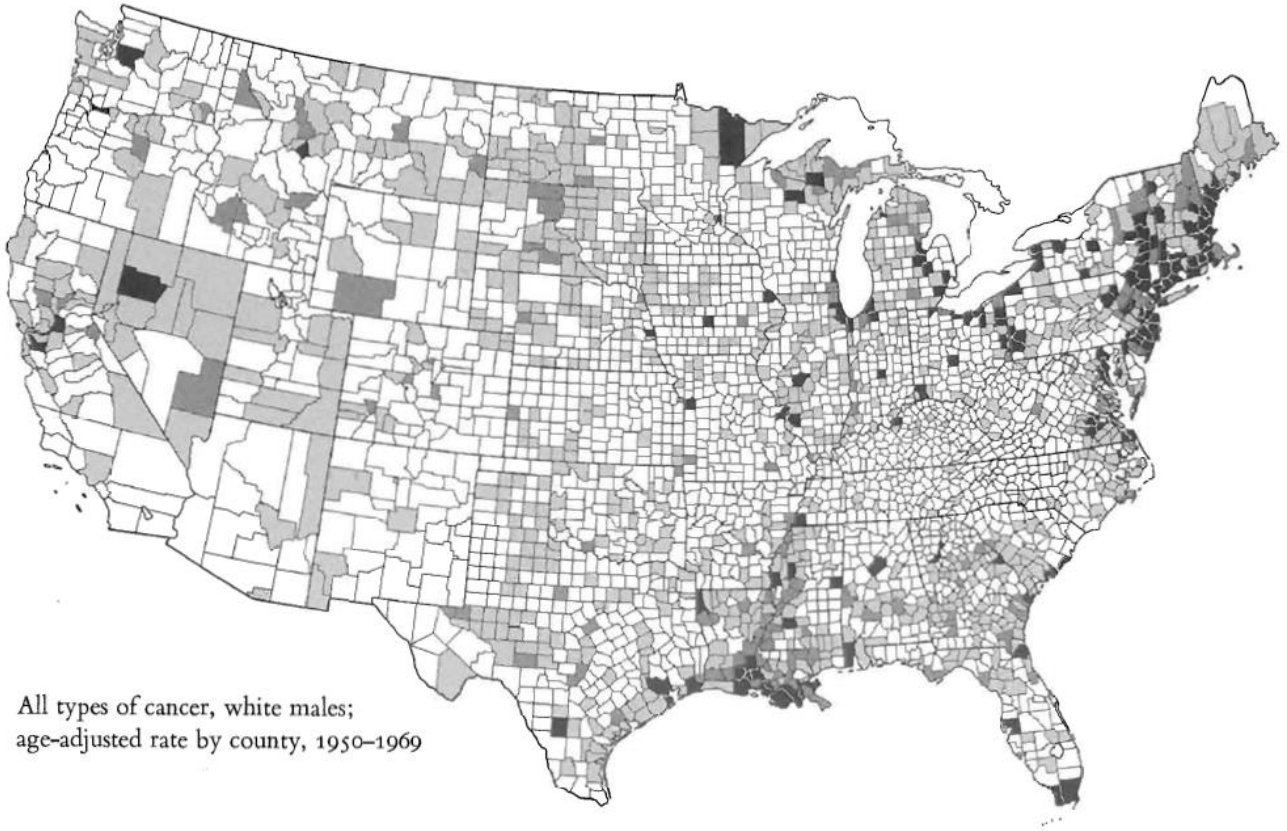
Types of presentations: Cloropleth map

- A thematic map, with colors representing characteristics of the spatial units, can be any statistical measure, can be continuous or categirical. Usually means of continuous characteristic.



- Beware of area size, choice of color and choice of categories.

All Maps of Parameter Estimates are Misleading (Gelman / Price 1999)



All types of cancer, white males;
age-adjusted rate by county, 1950–1969

Principles of Cartography

On Exactitude in Science
Jorge Luis Borges, *Collected Fictions*, translated by Andrew Hurley.

...In that Empire, the Art of Cartography attained such Perfection that the map of a single Province occupied the entirety of a City, and the map of the Empire, the entirety of a Province. In time, those Unconscionable Maps no longer satisfied, and the Cartographers Guilds struck a Map of the Empire whose size was that of the Empire, and which coincided point for point with it. The following Generations, who were not so fond of the Study of Cartography as their Forebears had been, saw that that vast Map was Useless, and not without some Pitilessness was it, that they delivered it up to the Inclemencies of Sun and Winters. In the Deserts of the West, still today, there are Tattered Ruins of that Map, inhabited by Animals and Beggars; in all the Land there is no other Relic of the Disciplines of Geography.

—Suarez Miranda, *Viajes de varones prudentes*, Libro IV, Cap. XLV, Lerida, 1658

Principles of Cartography: E. Tufte

Data-Ink

A large share of ink on a graphic should present data-information, the ink changing as the data change. *Data-ink* is the non-erasable core of a graphic, the non-redundant ink arranged in response to variation in the numbers represented. Then,

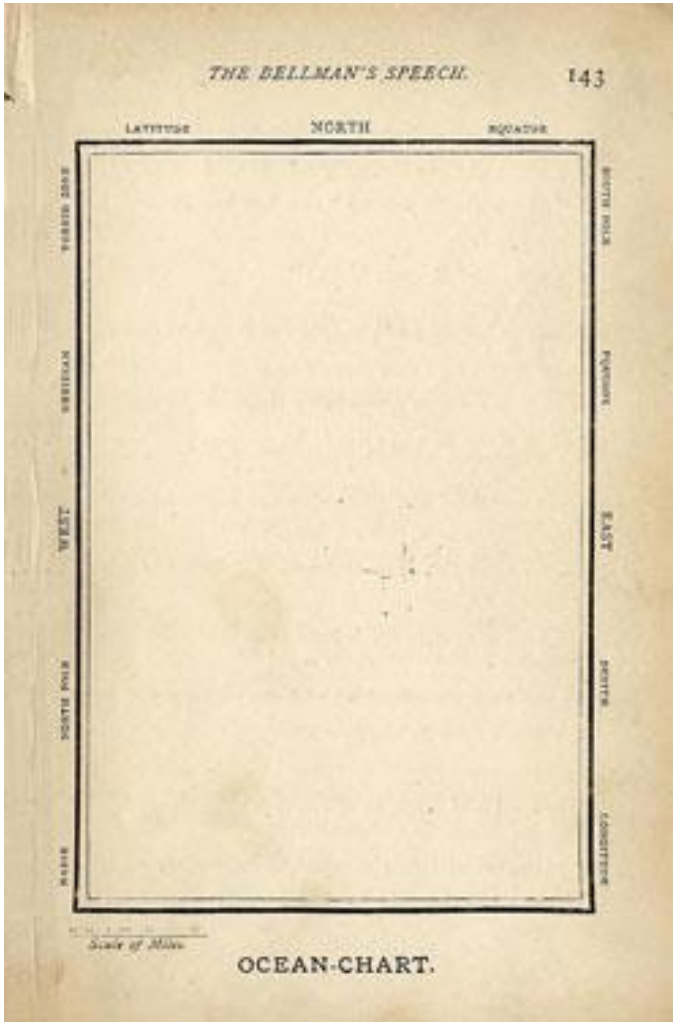
$$\text{Data-ink ratio} = \frac{\text{data-ink}}{\text{total ink used to print the graphic}}$$

$$= \text{proportion of a graphic's ink devoted to the non-redundant display of data-information}$$

$$= 1.0 - \text{proportion of a graphic that can be erased without loss of data-information.}$$

Principles of Cartography: E. Tufte

Commandment 1: Map Substantial Information



Map by Henry Holiday for Lewis Carroll's "The Hunting of the Snark" (1876) – radicalcartography.net

Principles of Cartography: E. Tufte

Commandment 1: Map Substantial Information

Commandment 2: Don’t Lie with Maps

Maps are always made with a purpose, and purpose will drive the choice of classification scheme. Each scheme has advantages and disadvantages and each obscures and emphasizes different aspects of the data.

Commandment 3: Effectively Label Maps

include explanatory text on maps: tell people what you believe the map is showing and why it’s important.

Commandment 4: Minimize Map Crap

Big, honkin’ north arrows, fancy borders, fake 3-D effects, etc

Commandment 5: Map Layout Matters

Commandment 6: Evaluate your Map

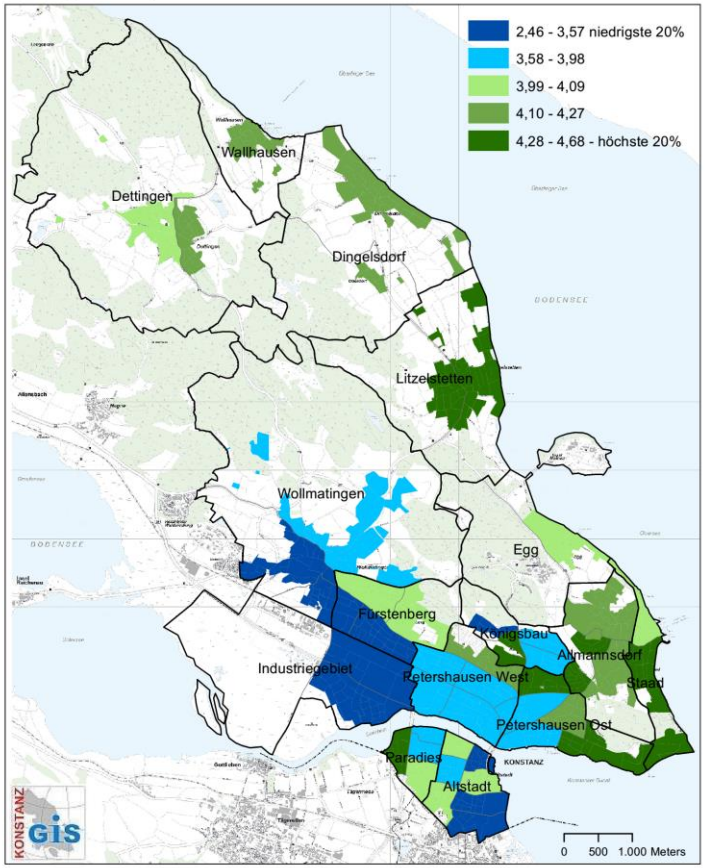
(Krygier 2007: makingmaps.net)

Principles of Cartography

When creating a thematic map, categories are key.

What do you want to communicate with the map. You can either highlight differences or similarities of spatial areas. Is comparability important?

Abbildung 1: Lebensqualität in der Nachbarschaft



Frage: Wie beurteilen Sie - alles in allem - die Lebensqualität in Ihrer Nachbarschaft?
Antwortkategorien: 1 = müsste stark verbessert werden; 2 = müsste verbessert werden; 3 = hat geringe Mängel; 4 = ist überwiegend gut; 5 = ist sehr gut.
Datenbasis: Konstanzer Bürgerbefragung (gewichtet); N(2015)=1588.
Kartengrundlage: Amtlicher Stadtplan Konstanz; Grafik © 2016; Amt für Liegenschaften und Geoinformation.

Principles of Cartography

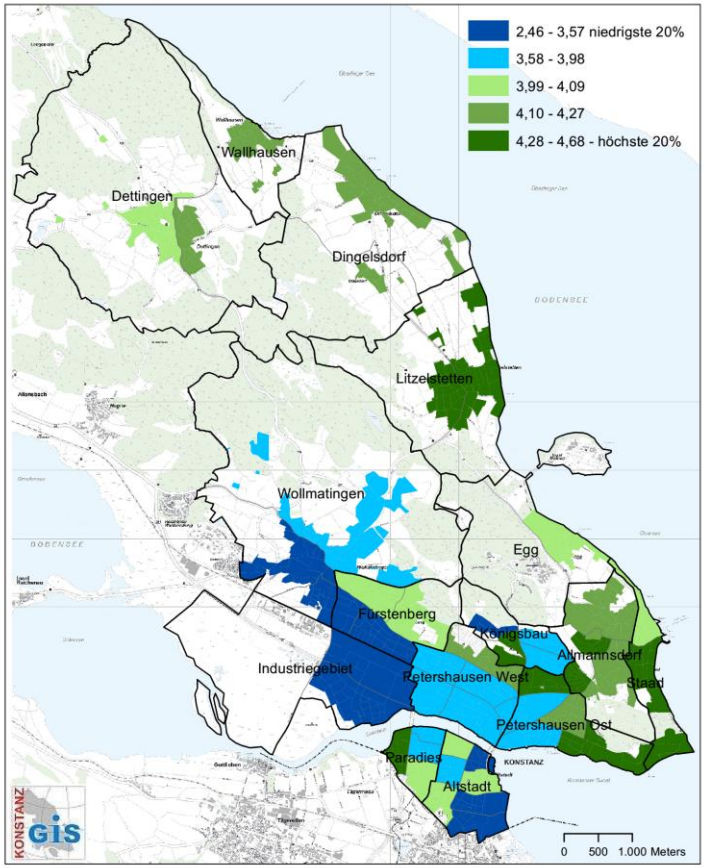
When creating a thematic map, categories are key.

What do you want to communicate with the map. You can either highlight differences or similarities of spatial areas. Is comparability important?

Colors are important.

Anticipate the use of the map
(print, copy, Powerpoint …) and the meaning of colors (Share of migrants in red?)
→ http://colorbrewer2.org/

Abbildung 1: Lebensqualität in der Nachbarschaft



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- **„Hands-on“ 3: Presentation of spatial data**

– Open your QGIS
– Add Point-data and, if needed a Basemap.
– Choose the presentation of the points (right-click on shapefile, → „Properties“, → „Style“).
– Zoom to the area of detail as desired.

– → „Project“ → „New Print Composer“

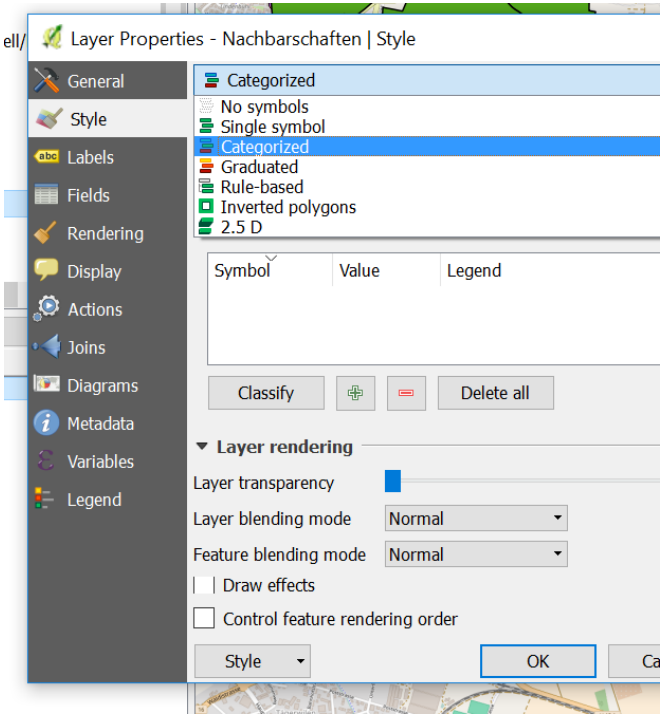
– Here, you can compose a map before printing or exporting it.

– Drag a box in which the created map will appear. 

– If you want, you can also include a north pointer, scale or legend (→ „Layout“).

– Export, save or print your creation.

„Hands-on“ 3: Presentation of spatial data



- Open a Polygon-Shapefile
- Choose the „Style“ „Graduated“

1. „Column“: choose Attribute to be presented
2. „Color Ramp“: Choose colors
3. „Mode“:Type of classification
4. „Classes“: Number of categories
5. „Classify“: here you go

→ „Apply“

- Colors and Borders can be specified in more detail after clicking on the symbol.
- The values in the legend can be manipulated (e.g. show not all decimals)
- You can adjust the transparency of the layer to show the base-map („Layer transparency“ – maybe you have to scroll a little down)
- You can manipulated the classes by hand by selecting „Histogram“.

- Layout, Export, save or print as before.

Universität Konstanz

Thank You
For Your Attention!

Thomas Wöhler
Fachbereich Geschichte und Soziologie, AG Hinz

Tel.: +49 (0) 75 31/88 - 3345
thomas.woehler@uni-konstanz.de