# Geographic Information Systems (GIS)

Boris Michel, 06/2020

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| **Aim of the method** | Geographic Information Systems (GIS) are software tools and methods that allow to visualize spatial data and analyse spatial relations between spatial(ized) phenomenon. They are especially helpful for producing convincing maps. By visualizing spatial distributions or relations, these maps allow us for example to see spatial patterns in our data. On the downside they require some degree of experience with very specialized software tools and often force us to standardize our data in order to get them into our database. Since the emergence of web 2.0 technologies, a wide range of simple web-GIS tools (often free) provide an easy way of making simple maps. In general, GIS are more suited to quantitative and standardized spatial data. Nonetheless, the technology can be used to visualize qualitative spatial data, for example in narrative and story maps |
| **Method suited for** | This method is suited for people interested in digital methods to visualize space and spatial relations. This method is most suited for people with a background in social sciences and affinity to digital technologies. |
| **Bibliography** | - Krygier, J.; Wood, D. (2016): Making maps. A visual guide to map design for GIS. 3rd edition. New York: Guilford Press.<br>- Harvey, F. (2016): A primer of GIS.New York: Guilford Press.<br>- Schuurman, N (2005): GIS. A short introduction. Malden: Blackwell.<br>- Look also for keywords like Critical GIS, Critical Cartography, Feminist GIS |
| **Themes** | Public Spaces; Spaces of fear; Spaces of pleasure; Historical Sites |
| **What do you need** | - Some basic understanding of those software and tools.<br>- Some basic understanding of cartography (see Krygier/Wood 2016 for a good and fun introduction). |
| **Requirements** | - Software like QGIS (free) or ArcGIS (proprietary) for proper GIS or web-GIS mapping tools like https://www.mapbox.com/. You can also make your maps from scratch for example by coding your map with the JavaScript library Leaflet. Be aware, that there are limits for incorporating dynamic maps as items into the Archive (see below).<br>- Primary or Secondary Data |
| **Contents** |  |

# GIS as a contribution to mapping and analysing the spatialization of drugs and drug related practices

Making maps in order to make sense of the world through a spatial understanding has a long tradition. This is also true for cartographies drugs and narcotics in urban space. While most of those maps where made to scandalize public drug use – e.g. the consumption of alcohol in the 19th century in the maps of the temperance movement or in moral panics about the drug trade in mass media – there is also a potential to map urban drug cultures from the perspective of critical scholars, activist and social movements. For example, in order to tell the history of the presence of drug cultures in urban space or to analyse the relation between the policing of open drug scenes and property value.
While there are many methods of mapping (e.g. participatory mapping) one tool for making maps can be found in GIS.

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| **Strengths of this research practice** | One of the powers of maps is the persuasive power of visualizations. Most of us are trained to read maps and to trust maps. Maps are a great tool to get an easy overview and to see spatial distributions and relations. Maps often stir imagination and make us think about the topics they deal with.<br>GIS contributes to the making of maps not only though tool to visualize data in maps with a very high degree of prevision and accuracy, but primarily through powerful tools for computing relations within or between data. |
| **Limits of this research practice** | GIS requires some technical skills and a basic understanding of cartography (for example on projections, geo-statistics, quantitative methods). Proper GIS software is complex and takes time to master. Web-GIS tools such as maphub.net or mapbox.com are much easier to use but also require some cartographic literacy, they are also often limiting with regards to map design and the export of your data to be included into the archive; especially if you want to have a dynamic map.<br>Making maps in general and GIS in particular is not without its dangers. What does it mean to try to understand a topic though its spatiality? Does locating things always us help to understand them or is there a danger to disguise causes and relations? For example, while mapping urban poverty can lead to an understanding of segregation and unequal geographies, it is much more difficult to also map the structural causes of poverty and social classes. While it is often interesting to see the "where" of things, this is often not the most important point. Thus, maps, especially in form of the standardized style of GIS can run into danger of telling very simple or simplified stories. GIS are not very good at being ambivalent, ambiguous and uncertain or about telling multiple stories about one place.<br>Also: Not only are GIS more suited to quantitative and standardized spatial data than for rich and complex narratives. The logic of digital databases also forces us to reduce the data to fit into quantified categories. But of course, you can locate complex and rich narratives and histories at a georeferenced location, for example a map of historical photos or stories about places. |

# Getting Ready

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| **Steps** | - Think about what you would like to map and if any of the aforementioned limits and risks or the following ethical issues apply.<br>- How do you imagine the map to be?<br>  o Should it be interactive (for example to guide to more in depth stories) or a static map that can be printed out?<br>- What will your data be?<br>  o Will you produce your own primary data or will you use secondary data?<br>  o Is it a big and standardized dataset (e.g. a long spreadsheet) or do you think of a handful and more in-depth places and stories?<br>  o Is your data suited for what you want to map (e.g. the format, the resolution, the type)?<br>- Think about the software you need.<br>- Think about what the software needs.<br>  o Software can be strict with regards to the data it accepts and can also be demanding in terms of specialized training. Check those requirements in the documentation before you get your data. |
| **Ethics** | Is there personal data in your data? What are the implications of mapping and making spaces visible on a map, for example for consumers of legalized substances and other vulnerable communities? Do people want their lives to be mapped? What are the implications of locating things and practices at an exact location? Can this be harmful to you or marginalized communities? Do you need the exact address or is the name of the neighbourhood enough for your argument? Generalization or randomization of points might be a good idea. Remember that these maps might be reused in other contexts and by other actors. Can you think of any way in which this can become a problem?<br>Before submitting maps that locate people, places and activist, keep in mind, that you have the responsibility to ensure that you are not providing data that might be harmful. |
| **Data Protection** | You are responsible for the data protection during the whole process and with regards to the published item.<br>Do not put any personal data or data that can be linked to individuals into web-GIS applications if you have not been given the consent to do so. Remember and make clear that many web-GIS applications fall under data protection laws outside of the EU. Do not save any personal data on cloud-computing services that are not covered by European data protection laws (like dropbox or googlesheets). If possible, do not use cloud-computing services for storing personal data at all. Anonymize any personal data before putting the data into your database or into tables. |

## In Action

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| **Steps** | - Collect your data. This process will vary heavily between the type of data you use and the sources of your data. But in the end you need to bring them into a format that can be imported as a layer or linked to a layer in your GIS or as single entries into your Web-GIS interface. Most common are tables and formats such as csv and xml. Refer to the documentation of your software or application for further details. During this process, you need to georeference your data. Be it the Latitude and Longitude of a point, line or polygon or an address such as a city or street that can be geocoded later. The latter can be used to blur the exact location for privacy issues.<br>- Consult the tutorial or documentation of the tools you are using to learn about how to turn your data into a map before you start.<br>- If your project involves spatial analysis, make sure that it is valid.<br>- Edit and design your map according to what your tool allows you to do and what kind of map you want to produce. There are great guidebooks on how to design maps (and on how not to design maps). The above-mentioned book by Krygier and Wood is a very intuitive and fun introduction. The tutorials to QGIS or ArcGIS are also very helpful.<br>- Export your data to be submitted to the archive (see below) |
| **Ethics** | See above |
| **Data Protection** | See above |

## Prepare the donation of your files

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| **Finalize the file** | Depending on the tools you are using and the output you imagine, export your data and map.<br>- This can be a static image file like a vector graphics format like svg. But raster formats like jpg are also ok for the archive.<br>- If your map is dynamic, your options depend on the tools you use. Some web-GIS tools only allow you to link to your map and your map's data remains on the server of the provider. In this case, you will get a link to embed your map into the archive. This is not preferred by the archive since interfaces, standards and those web-GIS applications can change and thereby make the map useless for the archive. It is much better to export all your map and data. Standalone GIS for example offers tools to export your maps into html, for example as OpenLayers or Leaflet (e.g. the qgis2web extension in QGIS). If your map contains further items such as images, sound or text that shall be embedded within a dynamic map, get in contact with us. |
| **Anonymise the file** | For the safety of everyone, it's vital that your file remains anonymous. |

# Upload your files