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# **GIS in Archaeology**

### 01 - Introduction

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18/09/24

based on Datapolitan-Training/qgis-training

You can download a pdf of this presentation.

### aims and objectives

#### aim

- Teach skills required for a complete GIS workflow
  - from data acquisition to analysis and cartographic output

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#### objectives

- · Introduction to GIS and fundamental cartography
- Practical work with archaeological (spatial) data
- Spatial analyses
- Creation of "presentable" maps with different levels of information
- · Learning the basics for later autonomous work with GIS

#### outcomes

- You will be familiar with the foundational concepts in spatial analysis and mapmaking
- You will understand the structure and purpose of GIS
- You will be practiced in applying spatial concepts to real-world problems
- You will be able to conduct spatial analyses
- You will produce decent maps

### schedule

| 18/09/24 | Introduction             |
|----------|--------------------------|
| 25/09/24 | no class                 |
| 02/10/24 | Working with QGIS        |
| 09/10/24 | Making Maps              |
| 16/10/24 | Georeferencing           |
| 23/10/24 | Handling Spatial Data    |
| 30/10/24 | Densities                |
| 06/11/24 | Interpolation            |
| 13/11/24 | no class                 |
| 20/11/24 | Making nicer Maps        |
| 27/11/24 | Terrain Data             |
| 04/12/24 | Least Cost Path Analysis |
| 11/12/24 | Site Catchment Analysis  |
| 18/12/24 | Visibility Analysis      |

The programme may change or shift depending on how well we progress.

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### organisational information

- Assessment:
  - active participation
  - homework
- You will need
  - to take part regularily
  - to make the homework
  - some frustration threshold...

If you do your homework at home, than you need a computer with QGIS: https://qgis.org/de/site/forusers/download.html

All slides and additional (video) Material will be accessible via the course home page https://berncodalab.github.io/gia



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who are you?

#### Please give a short statement about

What is your name?

What is your background in archaeology/computer/GIS?

One thing you hope to get out of the course

Describe a map you've seen/created/used recently and why it was interesting to you

Do you have any advice how we make this a successful seminar?



# Why Do We Create Maps?



# Types of Maps



# General Reference Maps

- Show important physical features of an area
- Include natural and man-made features
- Usually meant to help aid in the navigation or discovery of locations
- Usually fairly simple
- Can be stylized based on the intended audience (tourists vs locals)



Source: https://map.schweizmobil.ch/



# **Thematic Maps**

- Focuses on a specific theme or subject area
- Features on the map represent the phenomenon being mapped
- Spatial features used for reference



#### Temperatur

X Schliessen



#### Source: https://www.meteoschweiz.admin.ch/



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Source: Pinterest...

### Choropleth

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Source: http://www.estv2.admin.ch/

### Choropleth

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Source: https://www.srf.ch/news/schweiz/interaktive-karte-so-ungleich-ist-das-einkommen-in-der-schweiz-verteilt



### Area Cartogram – World Population



Source: http://www.visualcapitalist.com/



# Area Cartogram – European Unemployment rate



#### Source: http://www.viewsoftheworld.net/



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### **Distribution Map**

Heiko Steuer

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Abbildung 6. Verbreitungskarte der Bügelknopffibeln. Punktkreis: Typ Leipferdingen; Kreis: Typ Groß Nemerow; Dreieck: weitere Fibeln mit gestieltem Bügelknopf; Rhombus: Typ Leutkirch (nach Voß 1993, 174 Karte Abb. 27 mit Ergänzung).

Source: Steuer 1998



#### "Cultural" Map

Terberger et al. 2014



#### "Genetic" Map

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### **Basic Map Elements**

#### **Points**

#### **Vector Point Feature**



http://docs.qgis.org/2.8/en/docs/gentle\_gis\_introduction/vector\_data.html#overview

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#### Lines

#### **Vector Polyline Feature**



http://docs.qgis.org/2.8/en/docs/gentle\_gis\_introduction/vector\_data.html#overview

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### Polygons

#### **Vector Polygon Feature**



http://docs.qgis.org/2.8/en/docs/gentle\_gis\_introduction/vector\_data.html#overview

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#### Raster



https://docs.qgis.org/3.34/en/\_images/raster\_types.png



### How do we make maps?



### Geographic Information System (GIS)

A geographic information system (GIS) is a system designed to capture, store, manipulate, analyze, manage, and present spatial or geographic data. -Wikipedia



Source: GAO.

#### Or more simply

In a GIS, you connect *data* with *geography*. GISgeography.com



### Geographic Information Systems (GIS)

- Create interactive queries (user-created searches)
- Analyze spatial information
- Edit data in maps
- Present the results of all these operations



### QGIS

- a free and open source GIS software
- https://www.qgis.org/
- You might like to installed it...;-)



# QCIS



# Let's Get Started

#### Getting Data

- 1. Click this link and download the file to your desktop
- 2. Unzip the file
- 3. Click this link and download the other file also to your desktop
- 4. Open QGIS





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# **QGIS** Getting Started





# **QGIS** Getting Started

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# **QGIS** Getting Started

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### Add labels to data

- From Properties, select "Labels", "Show labels"
- Select attribute for label (this time "label")
- Style as you like

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# What We've Covered

- What is GIS
- Basic GIS concepts and tools
- Adding, styling, and labeling data in QGIS

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### Homework

- Style the polygons however you'd like
- Change the outline color or add a pattern
- Style the labels
- Change the font, the font size, or other attributes
- Send me a screenshot



# Any questions?



You might find the course material (including the presentations) at

https://github.com/MartinHinz/gia\_hs\_2020

You can see the rendered presentations at

http://martinhinz.github.io/gia\_hs\_2020

You can contact me at

martin.hinz@iaw.unibe.ch

Source: https://www.instagram.com/sadtopographies