Selected Issues of Historical Spatial Datasets

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Extended Abstract

The importance of using technologies in historical sciences is growing. One of the possibilities for extending potential of historical research is using geographic information science (GIS). GIS is nowadays equivalent for both science and technology and comes with its own approaches and theories for processing and evaluating data. In this contribution we would like to introduce selected aspects we encountered when trying to apply cartographical methods and theories for handling historical spatio-temporal data. We described selected issues concerning quality of data, visualization potential or possible data sources. As this work is primary motivated and supported by the work on project GEHIR (A Generative Historiography of the Ancient Mediterranean, ID MUNI/M/1867/2014), we will focus mainly on the ancient Mediterranean.

There are various properties of historical data and simultaneously there are a lot of issues connected with using historical data for cartographic analyses. Most of them are connected with its source and the process of data collection. It involve theory of spatiotemporal data (types of spatiotemporal data, visualization of spatiotemporal data), consistency of historical data, interpretation of spatial related historical data, linking of data, sources and creating historical datasets, digitalization of existing maps, geocoding of catalogues etc.

Important issues represent uncertainty of historical datasets. As we noted before a crucial part of historical dataset is the quality. In every component (time, space, attributes) is the quality specific. Temporal component represented by time record is often the most problematic dimension when dealing with historical data. The basic idea is that we are not always able to de-

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fine exact temporal dimension but try to combine different attitudes to time record as post quem, ante quem dating, time cycles, description of precision of sources of temporal data etc. Also in case of spatial dimension it is important to focus on historical context of spatial information, new critical analysis of the source is the essential condition, stochastic approaches, be aware of possible errors in dataset and it´s nature.

For the purposes of the mentioned project, we were focused on the data describing the ancient Mediterranean. After consultation with relevant scientists and our own research we found few projects collecting data from ancient world, storing, visualizing and analysing them. The Stanford Geospatial Network Model of the Roman World (Orbis) can be mentioned, because that among others enables calculation of the cheapest and shortest path between places in ancient Rome. It also provides the possibility for choosing the mean of transport or a month of year. Maybe the most valuable thing is the network analytic algorithm behind the webpage that moves the point of this project from displaying and storing data to modelling on them.

As another example Pleiades can be mentioned. It consists of the database and historical gazetteer built by a community of users. It stores a lot of relevant types of (ancient) places and provides some additional information, connection on other places and also a geographic representation.

The aim of project Pelagios is to retrieve data from other sources and provide a framework for their visualization. Therefore the essential part is a web map and the ftp repository for those data.

Also modern datasets should be used to study the ancient world. For instance soils types are not changing radically through centuries and could say us something more about agriculture in historical regions. Elevation data are still actual for most of the Mediterranean region as well.

There are also datasets not so actual but still with a potential to help understand the spatial phenomenon. This way older demographic census from the beginning of the 20th century could help us reconstruct the population before social processes like emigration or urbanisation in last decades and understand and estimate the overall distribution.

For the purposes of storing and classification of relevant datasets we started to build a wiki project. Where we are trying to cover all described issues. For describing spatial and temporal distribution we plan to use a visual techniques - heatmap or histograms with timeline. To define the completeness, granularity or quality we started a discussion with relevant experts to create a classification scale. Our goal is to create an interface that informs about possibilities and issues of using spatial data in historical research and

prepare a list of them. Pilot study was conducted on the Cyclades Islands. It consists of creation of the multidimensional model suitable for estimation of the risk potential of food self-sufficiency of the particular island. The first version of the model is presented below. In the next part of the mentioned project we would like to extend this model, build a simulation on top of its outputs and create an exploration tool to support our research work.

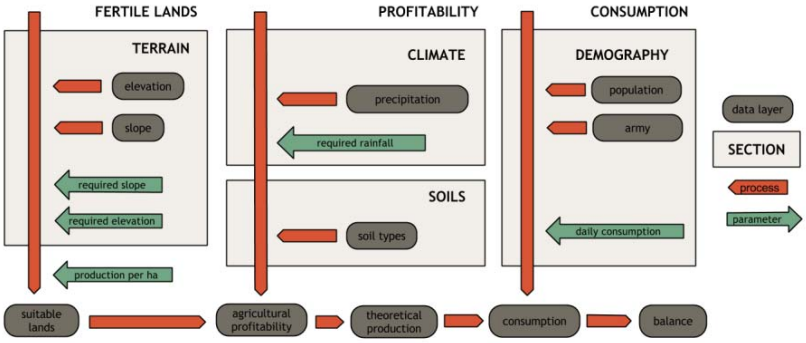

Figure 1. Model for calculating the theoretical food production/consumption balance of islands in Aegean Sea .

As we noted in this abstract, there is a lot of issues dealing with using geographical data connected with historical context for purposes of spatial analysis and visualization. As we are familiar with the theoretical concept of spatio-temporal data and approaches for handling them, our motivation were to define some problems occurred during our research and provide guidelines to support use of historical spatial datasets.

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