"What can GIS offer World History?" is the second in a series of debates being hosted on the History Compass Theory & Methods Blog (http://historycompass.wordpress.com).


The position papers and the original article are freely available there and all readers are encouraged to participate in the debate using the comments feature.

Professor Owens is correct in his argument that Geographical Information Systems (GIS) have much to offer to the study of history. “Historical GIS,” as the use of GIS in historical research has become known, has been around for about a decade. In that time large strides have been taken in a number of areas: the development of databases such as the national historical GISs, the development of methodologies suitable for the unique challenges that historical data and historical research imposes on GIS, the growing development of a literature on historical GIS, and most importantly of all, research that uses GIS to provide new insights into historical topics where the interest is not in the use of GIS per se, but instead in the knowledge that it brings to our understanding of a topic within the discipline of history.
At its core a GIS is a type of database. What makes a GIS unique is the fact that each item of data in the database is linked to a co-ordinate-based representation of where the feature is located. This may be a point, a line, a polygon (that represents an area or zone), or a pixel. This apparently crude structure that owes its origins to quantitative, data-rich disciplines such as the environmental sciences has much to offer historical research because a GIS is able to provide information on what, where, and when. The GIS structures information according to location in space, can integrate disparate sources based on where they are, allows us to visualise geographical patterns through maps and other techniques, and allows us to conduct analyses in which the results vary according to where the data under study are located. This has the potential to greatly enhance our understanding of space, place, location and geography in historical research.

GIS is frequently seen as a mapping technology. While I believe this to be a major oversimplification, it serves as a useful starting point in understanding what GIS has to offer to historical research. A map is commonly thought of as the end point of a piece of research, in GIS however it is close to the beginning. As soon a GIS database is created it can be mapped. These maps can be re-defined, analysed and re-created throughout the research process. The map is a way of identifying and describing the spatial patterns within the database. The GIS is thus a descriptive technology. Its ability to describe spatial patterns, combined with a computer’s ability to handle large volumes of data, allows us to describe complex spatial patterns in an easily understandable way. At its simplest this poses questions to the researcher – “why is this happening here but not here?”

More broadly however GIS allows us to challenge existing historical orthodoxies. In a piece of research that I recently conducted I used GIS to map changes in infant mortality rates across England and Wales from the 1850s to the 1900s. The patterns were striking: the largest absolute declines occurred in the cities, this might be expected. The biggest proportional declines however occurred in rural parts of the south and east of the country with the rural north and west showing the smallest proportional falls. The conventional explanation for declines in infant mortality over this period is that they were driven by public health reforms. This does not fit with the patterns that the GIS reveals: rates started to fall before public health reforms were introduced and were occurring in areas where the
public health movement would not be expected to have its biggest impact. This is not to say that public health reforms were not important, they probably were especially in urban areas. What it reveals is that to understand change in infant mortality over this period we need to understand that different things were happening in different places. The GIS is able to identify the different stories and where they were occurring. The reduction in rates in the rural south-east shows that there was a significant process driving down rates in these areas but that this failed to happen in the north and west. Urban areas had a very different story, and one whose characteristics were consistent with the public health story.

Here the GIS part of the analysis reaches its limits. We are able to describe the different patterns that occurred in different places and use this to challenge an explanation that was only based on one type of place. What the GIS is unable to do however is explain why the different stories occurred as they did. It is therefore primarily a descriptive approach that challenges more traditional forms of history to produce one or more explanations. Another example of this type of work is Geoff Cunfer’s On the Great Plains that looks at the pattern of dust storms over the entire Great Plains in the early twentieth century. Cunfer shows that there was little relationship between the number of dust storms and the degree to which an area was ploughed; indeed dust storms frequently took place in areas where no ploughing had occurred. This again challenges an orthodoxy, namely that the Dust Bowl was caused by over-intensive agriculture. Cunfer argues that the orthodox explanation originated in detailed studies of only a few areas near the centre of the Dust Bowl. Instead he argues that the Dust Bowl was more closely related to drought than it was to insensitive agriculture driven by the pressures of capitalism.

So GIS can and does alter the way that we are able to look at specific historical topics. As currently conceived however it does have some serious limitations. The first is that GIS to date has largely concentrated on quantitative data. This will inevitably make it only of limited use in much historical research which is far more orientated towards qualitative sources, especially texts. The way that GIS represents space is also strongly quantitative. GIS is well suited to representing precisely located features that can be well represented using points, lines or polygons. It is far less suited to “fuzzier” concepts such as cultural regions or to places whose exact location is not known. From a distance it might be thought that GIS is
well suited to exploit the “spatial turn”, however the concept of space used by GIS is far removed from the concept used by cultural historians. There are also some higher level problems that limit the adoption of GIS amongst many historians. These fall into three main categories. First, GIS software has become easier to use in recent years but still represents a barrier to entry. Second, using the software is one thing but understanding how it can be applied in historical research and what can be expected from it remains a barrier. Thirdly, creating GIS databases remains expensive and tedious work that often requires different skills to those of conducting research on the database.

This leads me to my questions for Jack which are as follows:

1. Does he agree with my identification of the strengths and limitations of a GIS approach in historical research? If so, what can be done to overcome the limitations?

2. Could he be more specific about how he feels that his project will lead to new understandings of trade in the Atlantic World? Will it be challenging established orthodoxies or developing completely new knowledge? Will it be descriptive or can it also be explanatory?

3. Why do we need “Geographically-enabled history”? After all, we have Historical GIS which is tightly focussed on the use of GIS. Above this historical geography is a well-established field to which people conducting historical GIS research are contributing almost by definition. Why then does he see the need for this intermediate level between the two?