

# The Spatially Interactive Literature Analysis System Study Tool: A GIS-Based Approach to Interpreting History in the Classroom

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## ABSTRACT

*The integration of spatial technologies with humanistic approaches to scholarship is expanding and creating new opportunities and challenges for students. Documenting information about source material is a fundamental step of the historical research process. Traditional geospatial data documentation is maintained within standardized metadata forms, but these are not well suited for documenting historical sources and are cumbersome for people new to GIS and metadata. The Spatially Interactive Literature Analysis System Study Tool (SILAS.ST) addresses this and other usage issues for students in undergraduate humanities courses. Through customized toolbars and map templates designed to be used with Esri software, SILAS.ST lowers the barriers to understanding the parameters of spatial datasets while at the same time models the processes of historical inquiry, documentation, and communication of research results. The use of natural language and focused prompts help students begin to understand complex mapping topics such as authorship, relevance, purpose, and uncertainty. This prototype tool aids in the introduction of digital mapping technologies to humanities students.*

**Keywords:** *Educational Technology, Geographic Information Systems (GIS), Historical GIS, Metadata, Qualitative Research, Research Methodology, Uncertainty, Undergraduate Education, Undergraduate Research*

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## INTRODUCTION

Maps and mapping have long held the interest of historians and humanities scholars. The *where* of

geography and the *when* of history are intrinsically linked, making place and location central concepts for both disciplines (Jessop, 2008; Mostern, 2010; Staley, 2007). For humanities scholars, maps have traditionally served as visual texts that effectively reveal patterns, support

DOI: 10.4018/jagr.2012070105

arguments, and illustrate narratives (Ackerman & Karrow, 2007; Black, 1997; Edney, 1997; Sparke, 1995; Staley, 2007). Maps and globes in digital form also serve as research tools for exploring historical questions (Holdsworth, 2003; Schultz et al., 2008; Universidad Francisco Marroquín, 2009).

The focus of humanistic map use is increasingly shifting towards maps generated through geographic information systems (GIS). Through its flexible tools, GIS offers the capacity to organize, archive, analyze, and display prodigious amounts of information in novel ways (Bailey & Schick, 2009; Bodenhamer et al., 2010; Brennan-Horley et al., 2010; Goodchild & Janelle, 2010; Gregory & Healey, 2007; Jessop, 2004; Knowles, 2002). Large scale research projects on China (Bol, 2008), the Holocaust (Knowles et al., 2009), the Salem Witch Trials (Ray, 2002), the Dust Bowl (Cunfer, 2002), racially-based housing discrimination (Hillier, 2003), the development of the railway system (Schwartz, 2010), and the Civil War (Knowles, 2008) have been undertaken in efforts to glean new insights from applying spatial analysis to historical questions.

The growing availability of digital geographic tools has also spurred increased interest in education from a spatial perspective (Brown, 2010; Sinton & Bednarz, 2007). New generations of superior mapping tools and data resources have significantly facilitated spatial analysis and, as importantly, qualitative learning (Mostern, 2010). This is due not solely to advances in mapping technology. Rather the combination of intellectual and technical skills has helped researchers and students ask robust and interesting questions when analyzing spatial patterns, allowing them to more deeply probe spatial relationships and to investigate causes for observed patterns (Gregory & Ell, 2007; Kwan & Ding, 2008; Schultz et al., 2008).

Humanities-oriented GIS applications have particularly captured the imagination of teaching faculty at many undergraduate institutions (Brown, 2008; Lloyd, 2001; Robinson, 2010; Sinton, 2009; Sinton & Lund, 2007). Instructors in these settings realize that simply mapping in

“layers” can greatly enhance students’ understanding of history and place (Mostern, 2010; Staley, 2007). Even the rudimentary process of manually overlaying clear plastic sheets, printed with different themes and map elements, reinforces the point “that places are complex, and that mapping spatial phenomena can reveal important, sometimes surprising juxtapositions” (Knowles, 2000, p. 29).

At the same time, the role of GIS in humanities scholarship and instruction is complex. Because the tools were not created with historical sources in mind, their analytical potential is more readily applicable to data rich fields within the natural and social sciences, less so in the humanities. Because historical data are often inherently imprecise and incomplete, measures of uncertainty and generalization must also be taken into account when interpreting historically informed spatial trends and patterns (Gregory & Ell, 2007; Knowles, 2002; Rumsey & Williams, 2002). The quality of historical data is difficult to evaluate with respect to many of the categories foundational to GIS (such as error and accuracy), since the data are rarely formulated in ways conducive to the exploration and manipulation typically used with GIS software (Gregory & Ell, 2007; Pearce & Louis, 2008; Plewe, 2002). Such realities often thwart attempts to confidently analyze and integrate historical data within GIS (Brown, 2010).

Including historical data on digital maps compels scholars to address issues of geographic data quality and completeness. For example, in an ancient frame, even data sets derived from the most reliable sources, may be deduced from inherently nebulous archeological remnants (Reed, 2007). Such sources are susceptible to historical inaccuracy, and some place locations will never be known with certainty. This ambiguity is rarely depicted in published maps. In turn, contemporary digital maps, whether they are addressing historical themes or not, often fail to cite their sources of information. This undermines and stymies critical inquiry by students who tend to trust the visual representation of mapped data (Schultz et al., 2008). Other formats of map publications, such as atlases,

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