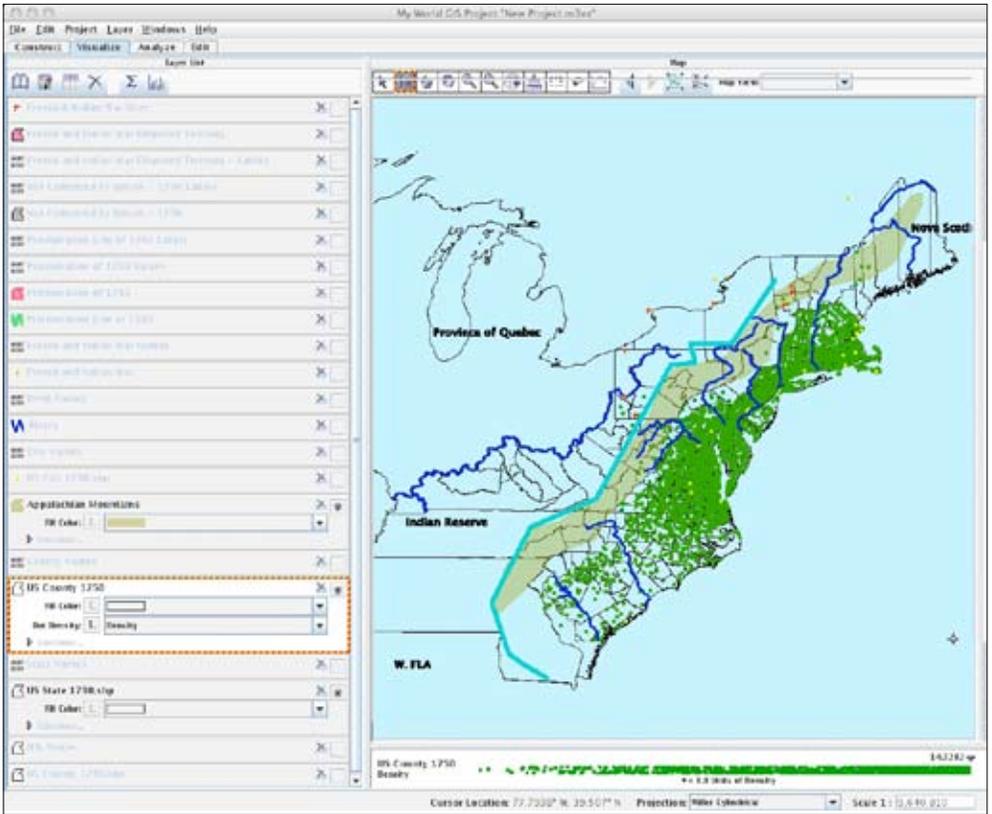


## “So *That’s* What the Whiskey Rebellion Was!”: Teaching Early U.S. History With GIS

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A GOOD, TEACHER-CENTERED HISTORY LESSON is a magic act: the instructor conjures distant people, places, events, and perspectives, bringing them to life in a single class session. A good, *student*-centered history lesson is even more miraculous: the teacher has engineered a task or series of tasks that allow the students to work this same magic as they analyze primary sources, parse data sets, or engage in simulations or debates. Even more rare are opportunities to observe the difference between history and historiography. The former focuses on “What do we know of what happened in the past?” and informs the popular understanding of what a history class should be about; the latter is what historians actually *do*—i.e., make assertions about not just what happened, but how our understanding of it is constructed.

A tool for pursuing all of these feats—effective teacher-centered instruction, powerful student-centered instruction, and engagement in historiography—is the Geographic Information System (GIS). GIS tools have existed since the 1960s, but only since the 1990s have educators explored their application to social studies. Proponents expect GIS to have a dramatic impact upon teaching and learning in K-12 classrooms, but these hopes have been frustrated by the complexity of the tools and datasets. GIS software requires a steep learning curve, and assembling the relevant data is difficult. While outstanding instances of GIS materials for history education exist (e.g.,



**Figure 1:** Datasets used in the French and Indian War lesson.

<[www.gisforhistory.org](http://www.gisforhistory.org)>), there has been no ground-swell of GIS-based materials for history classrooms from teachers, publishers, or researchers.<sup>1</sup>

One obstacle may be pedagogical: When GIS is introduced into the classroom, what teaching strategies are employed? Reviewing GIS-related literature in social studies education,<sup>2</sup> we observed that the *only* instructional model presented is inquiry. While GIS can support inquiry learning in powerful ways, we know that such lessons are time-consuming. Given the crowded history curriculum, teachers must carefully parcel out instructional time, meaning that in-depth inquiry—particularly with complex tools such as GIS—will be a rare occurrence. If GIS is used solely in the context of an inquiry lesson, the tool may be relegated to “sidebar” status in terms of classroom use, something students encounter only a few times a year. However, in our experience, GIS can support powerful learning in a wide variety of instructional modes, whether students use it

hands-on or instead view and respond to displays being manipulated by the teacher.

A second gap in the literature is content selection: the literature on GIS in K-12 schooling addresses geography education. However, GIS can and should be used in the context of other fields, such as history education. When applied to history education, GIS can support students' conceptual understanding and critical thinking—or even appreciation of historiography, an elusive goal for history educators.<sup>3</sup>

We have developed three history lessons using GIS (with full documentation and datasets available at <[www.delicious.com/tchammond/geospatialSS](http://www.delicious.com/tchammond/geospatialSS)>) in both teacher-centered and student-centered modes, with the third lesson addressing historiography. The materials were developed using the *My World GIS*, available from PASCO (<[www.pasco.com/featured-products/my-world-gis](http://www.pasco.com/featured-products/my-world-gis)>). The lessons are designed for middle school, but can be easily adapted to other contexts. The lessons cluster on early American history: the French and Indian War, the Constitutional Debates, and the Whiskey Rebellion. All are tightly grouped in terms of time (1754-1794), causality (each episode plays a major role in setting the stage for the following episodes), and curriculum (they commonly fall together within the same semester or even the same month of an American History class). While each topic addresses the traditional political/military national narrative, they also emerge from specific aspects of early American geography, demography, and economics—all of which are well suited for GIS. Through repeated use of GIS, students can think more deeply about history's geospatial dimensions and even engage in the construction of competing historical accounts.

### **Lesson One: The French and Indian War**

The French and Indian War is a rich topic for designing instruction. We elected to focus on the Proclamation of 1763, as it simultaneously captures the tensions of the time period and provides a basis for understanding the subsequent conflict between the colonies and Parliament. To provide the context for these actions by the Native Americans and the British government, we use a period-appropriate map and a modified version of the 1790 census. (To approximate the colonial population circa 1750, we modified the population data for trans-Appalachian counties, case-by-case: for counties settled after 1750, we changed their population to zero.) Finally, we added landmarks such as rivers, the Appalachian Mountains, colonial-era cities, French and Native American points of interest, battle sites of the French and Indian War, and the line established by the Proclamation of 1763 (Figure 1).

These materials can be used in many ways, but we envision them as being a first experience with GIS in a teacher-directed, whole-class investigation. The teacher introduces the layers one at a time, prompting students at each step: What are we looking at? What do you infer? What questions do you have? If students will readily recognize a map of the colonies, the teacher can start there; if they need additional context, the teacher can juxtapose the colonial map with the contemporary map. After adding the population layer, the teacher asks students to describe and explain the pattern—why are the British colonists concentrated along the coast? What is shaping or directing their expansion? The key feature is the Appalachian Mountains: the settlers are concentrated on the eastern side, and the visual suggests momentum—they wish to cross the mountains and expand westward. The forks of the Ohio (the confluence of the Allegheny and the Monongahela Rivers) form the closest strategic outpost, and so becomes a natural target for both French and British expeditions.

All of these understandings can be developed from static maps or alternative displays, such as a Google Earth overlay. However, the GIS layers allow the teacher to direct students' attention and guide them from one concept to the next in an open environment. The technology and the guiding questions are in the teacher's hands, but the students have responsibility as co-creators of the *meaning* of the map at each step.

## **Lesson Two: The Constitutional Debates**

The Constitutional Convention is another topic that presents teachers with an embarrassment of riches, from primary sources to simulations to documentary film. These approaches are excellent, but in the interest of creating a sequence of GIS-based lessons, we framed the topic as a guided inquiry: students use the GIS hands-on, but in a structured process. The lesson may span more than one day, depending on how long the teacher wishes to let the inquiry process run.

The teacher opens by eliciting students' prior knowledge of the Constitutional Convention. From immediate previous instruction, students should be aware of the Articles of Confederation and the resulting weak central government. From life experience and/or instruction in earlier years, some students will be able to name the branches of government and give at least partial explanations of topics such as checks and balances. The teacher can use these student contributions as instructional springboards to sketch out the main concepts debated at the Constitutional Convention and set forth in the final document: representative democracy, an elected government selected through a mix of direct and indirect election, independent branches, and a division of power among branches.

The focus of the inquiry is representation: given the broad strokes of the Great Compromise (a bicameral legislature with one house apportioned equally among the states and the other house apportioned by population), *How many representatives should each state seat, based on its population?* At this point, students should divide into small groups and receive a computer. If the teacher senses that several students already know “the right answer” (i.e., the historical solution of the Three-Fifths Compromise), they can be sequestered in a single group, allowing other groups to reach their conclusions independently. Another tactic is assigning groups to roles: one group seeks to maximize the influence of Rhode Island (small population, all free), another Georgia (small population, large percentage enslaved), and so forth.

The teacher demonstrates the use of GIS by walking students through the decision making process behind the Senate: equal representation of states, regardless of population (i.e., the New Jersey Plan). The teacher guides the students through loading the states’ census data and coloring the map by total population. Next, students generate a layer showing the number of members per state: students can select their own rule (one senator per state? three?) and create a new field that assigns the states a number of seats. Finally, students will color-code the map according to these seats (i.e., everything will be the same color).

Once students understand this process, they can be turned loose to determine the rule for “the people’s house”: will seats be apportioned by total population? Free population? Free males? Regardless of the strategy selected, students will follow the same two steps of generating a new layer and coloring that layer to show the number of seats per state (Figure 2). Once a group has devised its solution, they take a screenshot of their final map and present it along with a brief description of their analysis. For a short activity, the teacher should limit each group to just one or a few iterations of producing layers as they try out solutions. For a longer experience, the teacher can require students to reach a consensus solution by finding a compromise.

If no group arrives at some version of the Three-Fifths Compromise (which is common), the teacher should illustrate the reasoning via GIS. We use the rule of one representative per 30,000 people (Article I, Section 2) as the starting premise, and then work through the implications when applied to the total population, total free population, and the fractionalized compromise. This treatment of the Constitutional Convention allows students to see how the political calculus of needing to reach an acceptable compromise overwhelmed the moral considerations of slavery—which, to be frank, were not as strongly presented in the debate as students tend to assume. More importantly, students can see the Convention not as a



However, the Whiskey Rebellion is deserving of careful treatment. The event is historically significant, a compendium of firsts: the first time federal military power had been exercised against its own citizens, the first and *only* time a sitting President acted as field commander of the military, and the first draft (and draft resistance) in the history of the Constitution. Teachers can use the event as a conceptual pivot, contrasting the non-response to Shay's Rebellion during the Articles of Confederation to the new Constitutional authority of the executive branch to assemble and command lethal force against its own citizens. Finally, the Whiskey Rebellion presents an opportunity to observe history and historiography develop simultaneously, as Hamilton and other actors presented sharply contrasting accounts within months of the rebellion. These disagreements extend into the present day, with some historians describing the excise tax and the domestic show of force as a failure, while others commend Washington's actions as setting the new government on a course for political stability and fiscal solvency.<sup>5</sup>

Our lesson starts at the height of the conflict by displaying the movement of the federal forces as they marched into western Pennsylvania. This scenario provokes questions—Why are these troops crossing the Appalachian Mountains? Who is their opponent? This introduction intentionally withholds from students the specific details of the rebellion, such as the excise tax. Each component arrives as the teacher unfolds the details: the destination of the army is western Pennsylvania, specifically, the farming communities in the vicinity of Pittsburgh. These farmers are in revolt over a new federal tax. These taxes are designed to service the national debt, most of which is currently held by eastern speculators.

The key question for students is, *Why did the western farmers feel so strongly about this tax?* If students cannot understand the economic threat posed by the tax, then Hamilton's misleading characterization will stand. Some may reason that since George Washington is on the other side of the conflict, the farmers must be in the wrong. At this point, the teacher introduces the population data and asks, "Where was the primary market for the farmers' products?" Students' attention will be drawn towards the east, where the largest population centers are located. The follow-up questions seek elaboration: "How would the farmers transport their crops to these markets all the way across the mountains? At what expense?" Students will grasp that the distances involved are quite significant—traveling across Pennsylvania required weeks, particularly if hauling wagon-loads of goods. The final question poses an innovation: "What if you could transform your product into something more valuable, portable, and stable, holding its value over many years?" This transformation was distillation, changing grain into spirits. American farmers (including George Washington!)

depended upon this process; for small producers, Hamilton's 10¢-per-gallon tax on its production recalled the Stamp Act levied by the British Parliament to pay its debts.

The next stage of the lesson departs from the GIS to explore the historiography through selected primary and secondary sources. For example, the rebellion gives a clearer context to the Antifederalists' concerns, such as Patrick Henry's aspersion of the Constitutional Convention ("I smelt a rat"). Given a firm understanding of the issues in Whiskey Rebellion, students can engage these debates and see that dissent, resistance, and questions of governmental authority did not end with the American Revolution, but are present throughout the nation's history.

To conclude, students return to the GIS and add placemarks to the dataset, sharing what they have learned from their reading. By adding these points, students are enriching the geo-referenced accounting of this history.

## Conclusion

As historian Ed Ayers observed, "history may be better suited to digital technology than any other humanistic discipline."<sup>6</sup> Revolutionary work is taking place within the history profession, both through the efforts of Ayers and others.<sup>7</sup> While we share their enthusiasm, we are also mindful of the constrained environment of the K-12 curriculum and classroom. We hope that the lessons and materials presented here offer an example of the opportunities, both in terms of pedagogy and content, offered by integrating digital geography into history instruction. We welcome comments on our work and look forward to an exchange of ideas. GIS for history education is still in its early stages, and we anticipate the many exciting projects that lie ahead.

## Notes

We would like to acknowledge Yuanyuan Zhang (of Lehigh University), an important contributor to the modified datasets used in the first two activities.

1. Andrew J. Milson and Marsha Alibrandi, eds., *Digital Geography: Geospatial Technologies in the Social Studies Classroom* (Charlotte, NC: Information Age Publishing, 2008).

2. No examples were found in *The History Teacher*; turning to *Social Education*, we located Marsha Alibrandi, Candy Beal, Ann Thompson, and Anna Wilson, "Reconstructing

a School's Past Using Oral Histories and GIS Mapping," *Social Education* 64, no. 3 (April 2000): 134-140; Marsha Alibrandi and Herschel M. Sarnoff, "Using GIS to Answer the 'Whys' of 'Where' in Social Studies," *Social Education* 70, no. 3 (April 2006): 138-143; Andrew J. Milson, Kathleen Gilbert, Brian Earle, "Discovering Africa Through Internet-Based Geographic Information Systems: A Pan-African Summit Simulation," *Social Education* 71, no. 3 (April 2007): 141-145; Andrew J. Milson and Mary Curtis, "Where and Why There? Spatial Thinking with Geographic Information Systems," *Social Education* 73, no. 3 (April 2009): 113-118; Thomas Hammond and Alec Bodzin, "Teaching With Rather Than About Geographic Information Systems," *Social Education* 73, no. 3 (April 2009): 119-123.

3. Thomas D. Fallace, "Historiography and Teacher Education: Reflections on an Experimental Course," *The History Teacher* 42, no. 2 (February 2009): 205-222.

4. William Hogeland, "Why the Whiskey Rebellion Is Worth Recalling Now," *History News Network* (July 2006) <<http://hnn.us/articles/27341.html>>.

5. Steven Boyd, ed., *The Whiskey Rebellion: Past and Present Perspectives* (Westport, CT: Greenwood Press, 1985).

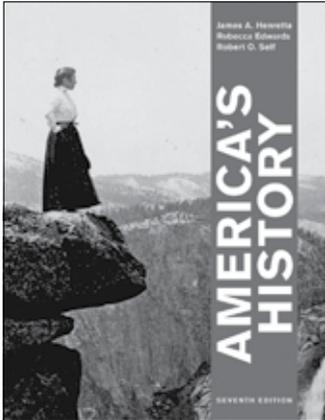
6. Edward L. Ayers, "The Pasts and Futures of Digital History," <<http://www.vcdh.virginia.edu/PastsFutures.html>>.

7. Ayers' work at the Virginia Center for Digital History (<[www.vcdh.virginia.edu](http://www.vcdh.virginia.edu)>) is a landmark in digital history. As example of an emerging body of scholarship that we are particularly keen to examine, we await the work of the Holocaust Historical GIS project (<<http://www.nsf.gov/awardsearch/showAward.do?AwardNumber=0820501>>).

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