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## Commentary

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### Political applications of the geoweb: citizen redistricting

#### Introduction and background to redistricting in the USA

Redistricting and apportionment are two of the most critical and yet least understood political processes that occur in the United States. Important decisions are often carried out behind closed doors, and although they will affect nearly every resident in the United States, citizens traditionally have little role in the decision making. Citizens are also often at a disadvantage in interpreting the plans that are produced and being able to explore and make alternative plans to the one that finally emerges from the state capitol.

In this commentary I analyze the role that ‘geoweb’ or new spatial media technologies can play in making this opaque political process more transparent. The current round of redistricting is the first to occur following the emergence during the mid-2000s of tools and technologies variously known as the geoweb or volunteered geographic information (VGI). Of particular interest is the question of whether civic engagement in redistricting would offset the relatively low rates of voter participation and citizen engagement, especially in non-Presidential election years (‘Midterms’). Would engagement in redistricting translate into a more active political engagement in general? Or would VGI-enhanced redistricting simply make it easier to carry out electoral manipulation and malapportionment: a fear that has attended redistricting since computer tools were first applied to it in the 1990s (Altman and McDonald, 2010)? [Assuming malapportionment or gerrymandering can be unambiguously identified (see Johnston, 2002).]

This latter fear is cited more generally in the Goodchild and Turner conversation (Wilson and Graham, 2013). New tools and technologies, however exciting, are always susceptible to unintended and undesirable uses. But the deployment of a technology always occurs in some context, in this case a sociopolitical one. Until the last five years computer usage in redistricting was expensive and access to data was restricted to small numbers of people working for state legislatures. During the 1990s, for example, states reported spending more than \$500 000 on average for software, hardware, and support. All states used computer technology during 2001 redistricting at a fraction of this cost, increased the public availability of data (78.8%) and even accepted public submissions (81%) (Altman et al, 2005). Nevertheless the numbers of people actually participating remained miniscule and were dominated by specialists. Costs also have remained significant, not only for the process itself (the media reported that the state of Georgia will pay \$3.8 million for redistricting this year), but also for legal challenges.<sup>(1)</sup> The insertion of open access VGI into this situation clearly retails the landscape away from a cadre of experts, and away from a predominantly public *consumption* of the plans, and toward public participation and *production* of plans. Furthermore, by investigating alternative plans, citizens can advocate solutions that meet other criteria (eg, making more competitive districts). Finally, evidence is emerging that citizen bloggers are already *analyzing* proposed plans: for example, to investigate the political landscape for the 2012 presidential election.

Haklay (2011) has offered a hierarchy of VGI involvement. ‘Normal’ VGI and citizen science refers to crowdsourcing and data contributions (eg, OpenStreetMap). ‘distributed intelligence’ VGI is where citizens provide interpretations of information (eg, participate in Q&A fora). In ‘participatory science’, citizens actively participate in the problem definition and data collection. The highest level of participation is ‘extreme citizen science’ which

<sup>(1)</sup> See <http://www.gpb.org/news/2011/04/15/lawmakers-return-this-summer>

involves true collaborative science (or politics). At this level, citizens participate in problem definition, data collection, and analysis. Using this terminology, then, can we envisage extreme citizen politics?

In Haklay's 'extreme' citizen science, citizens participate at the highest levels: for example, in defining the problem framework, and participate in discussing and analyzing the results. In redistricting, there is not the possibility of framing the initial problem (which is already established in the politicolegal framework: that is, of how many districts there will be), but certainly participate in creating, discussing, and analyzing the results. Furthermore, there is the possibility of framing the *political problem* (that is, of achieving safe seats, or of avoiding a Voting Rights Act challenge).

Although the same kinds of politics of redistricting are not likely to go away in the VGI age (redistricting remains a political process, as it should be) the process is now more transparent and participatory. In this context I think it is necessary to highlight the distinction made by Turner of the "citizen as sensor versus the citizen as cognizant, operating element of a complex system" (Wilson and Graham, 2013, page 7). These comments mesh well with Haklay's distinction between passive and active participation, with citizen politics encompassing both, but especially active participation. Indeed, we can already see that citizen politics (nonjournalists, nonacademics, and nonlegislators) are actively creating new knowledges.

For example, political bloggers have created resources such as Ballotpedia (<http://www.ballotpedia.org>) which is a political atlas of redistricting. Using cloud storage spaces such as Google Docs and Dropbox, other groups share statistical breakdowns of redistricting data. For example, a project by the liberal blogs Swing State Project and Daily Kos takes the final redistricting maps as they are approved and calculates the presidential outcome by Congressional District (CD). (This is also implicitly possible for any district in case 2 below.) That is, for each new district, how many Obama and McCain voters are included? This allows some understanding of the swing for each district going into the next Congressional elections.

Other citizen actions include:

- North Carolinans for Redistricting Reform: advocates a state constitutional amendment that would allow nonlegislative redistricting by an independent commission;
- Represent Me Utah: advocates fairer districts and an end to gerrymandering;
- Fair Districts Now, Florida got two ballot initiatives passed to prevent incumbents from exercising undue influence on redrawn districts;<sup>(2)</sup>
- Midwest Democracy Network/Draw the Line Midwest is a regional political group pushing to 'depoliticize' the redistricting process through increased transparency, participation, and protection of minority rights (Midwest Democracy Network, 2011);
- DrawCongress.org is a project at Columbia Law School whereby students create nonpartisan redistricting maps for the entire country;
- Dave's Redistricting App (DRA) is an online mapping site that allows the user to create any districting solution they like for all states (excepting Alaska). (See case study 2.)

Redistricting in the United States is a nuanced and complex process, involving niceties of census data, balancing constitutional requirements, historical legacies of discrimination, and legal constraints. It is also commonly highly partisan, given that state legislatures around the country are largely responsible for performing redistricting. According to Ballotpedia (2011), redistricting is done by commission in nine states, by the legislature in twenty eight, and by

<sup>(2)</sup>Although incumbents do not draw their own districts, this does not mean there is no political influence on district boundaries by Representatives. In Georgia, for example, the new district is likely to be drawn in the northern metro Atlanta area due to population growth there. The Governor, who has to sign off on the plan, comes from northern Georgia, as do key state legislators.

a hybrid in thirteen. (Seven states have only a single district and an ‘at large’ Congressional representative.)

Once a state is apportioned (receives its allocation of Congressional seats), it redraws the boundaries of each representative’s district. Since this is often done by the state legislature, one opportunity for citizens to be involved is to take part in the legislative elections. This is an overlooked opportunity since elections take place the previous year (November), well before redistricting occurs. Voter turnout in 2010 was around 40% of eligible voters excluding voter age not eligible, felons, and noncitizens. Voter turnout is lowest among the poor, minorities and young people. A commonly cited factor is the lack of investment in the political process—people feel their vote does not count. High incumbency rates, politically “locked” states (ie, with seemingly foregone conclusions), and relative lack of media coverage and transparency all contribute to lowered turnout.

There are two remediations to low turnout that VGI can assist with. One is public education of the voting and redistricting processes. More highly educated states have higher voter turnout. Geographers and other social scientists already perform some outreach (eg, the Public Mapping Project). More could be done. Political geographers could use VGI to engage citizens in elections and election outcomes through blogging, Twitter, and other social media. Elections are natural material for maps. You can map outcomes or exit polls. You can download and map census data. You can analyze and predict future outcomes such as Presidential results based on the new districts. A public service outreach site with tools for user participation in electoral analysis (say a cross between the Floating Sheep Collective and the Swing State Project) seems a natural.<sup>(3)</sup> Geographers could take a leaf out of the pioneering work already done by political bloggers (Armstrong and Zúniga, 2006; Crampton, 2008).

A second process is electoral reform. After all, states decide whether legislatures, a bipartisan commission, public consultation, or other process will map the districts. Currently only nine states do not use the legislature. It is clearly not easy for legislatures to relinquish control over the process. Nevertheless, this is one of the defining questions of the contemporary age: to what extent does government have a monopoly not only on the political process, but on access to information? In his discussion of the problems collecting the German census, Hannah (2010) has investigated what scope there is for ‘informational citizenship’, that is for citizens rather than government to access, control, and distribute information. Goodchild expresses concern that VGI is not as ‘replicable’ as traditional GIS (Wilson and Graham, 2013). Given that political redistricting is traditionally opaque, then VGI, by providing tools for participation, may actually be making it more replicable. Citizens can not only reproduce maps produced by legislature but provide alternatives.

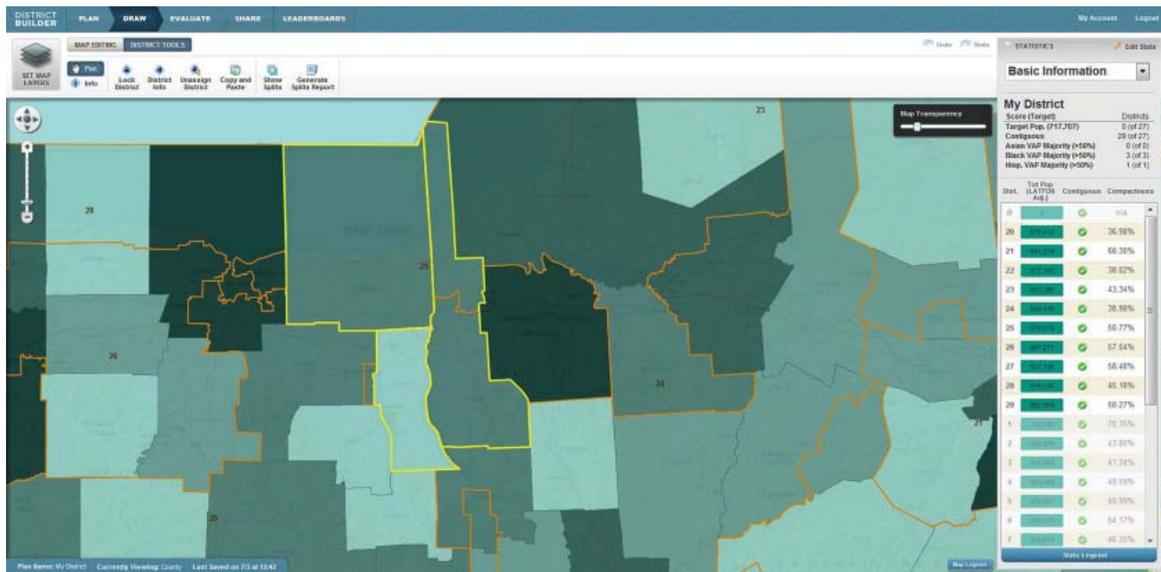
The rest of this commentary focuses on VGI developments for redistricting itself. Developments in geotechnology and VGI offer enormous and exciting potential for citizen engagement, and yet should not be uncritically expected to solve all problems or come without their own issues. Three case studies will be discussed, a public redistricting effort led by social scientists, an online site by a software engineer with political interests, and a solution from the GIS company Esri.

#### **Case study 1: publicmapping.org**

The Public Mapping Project (<http://www.publicmapping.org/>) provides an open source application for redistricting, District Builder (figure 1). It is led by two political scientists Michael McDonald and Micah Altman with software from the Philadelphia mapping company Azavea.

The goal is explicitly VGI: open access, public participatory knowledge creators. It is aimed at the interested layperson without specialist knowledge in GIS, or mapping. The site

<sup>(3)</sup> See <http://www.floatingsheep.org/> and <http://elections.dailykos.com/>



**Figure 1.** [In color online.] District Builder from Public Mapping.

provides extensive documentation of census and electoral data, as well as a user guide that explains many of the intricacies of the process (for example, aggregating and disaggregating data to different geographies).

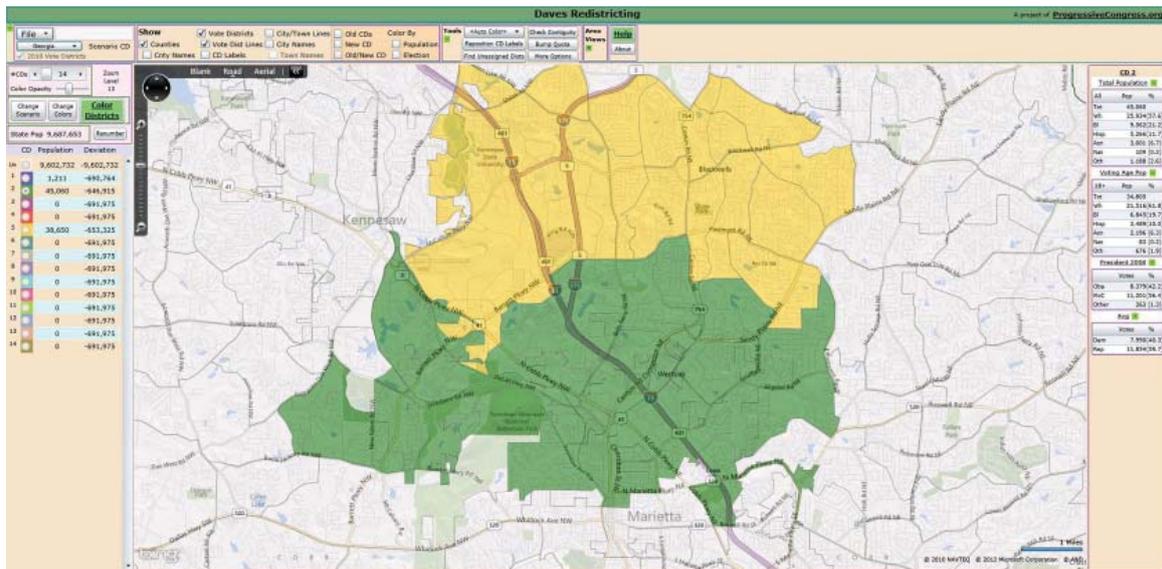
The site provides a capability to create real, legal districts. It is an offshoot of the work of McDonald and Altman, who as far as I am aware are the only educators to have provided an open source/VGI solution to redistricting on a nationwide basis.

The site also provides information on the viability of the districts by three typical criteria: deviation, contiguity, and compactness. Deviation is the degree to which each district total population differs from the target population (typically total state population divided by number of Congressional districts). Contiguity and compactness assess whether all parts of the district are contiguous, and whether they are geographically compact. Compactness can be measured in many ways, but two basic measures are common: the degree of dispersion and the amount of indentation.

**Case study 2: Dave’s Redistricting App**

This application is an easy to use online solution for redistricting (figure 2). It is a Silverlight/Bing map mashup running as an ASP page in a web browser. Projects can be saved in XML. Voting district boundaries are sourced from 2010 TIGER/Line shapefiles from the Census Bureau, and election data have been provided in-house.

For each state (eg, Georgia) you load the data and assign the number of districts you wish to create (eg, 14). As you sweep the mouse over the basic geographic units (voting tabulation districts or VTDs) the application maintains a running tally of the population in each district, as well as its key attributes. These include racial/ethnic breakdowns for all residents, for those 18 years and older (voting age), the sum of the votes for President in 2008, and the party vote breakdown. It also indicates the target population for each CD (eg, 691 975 for Georgia) and the deviation (whether your district is too big or small). The site provides 2000 and 2010 population data for all states (except Alaska) and election data by VTD. A final useful feature of the site is that you can download the VTD election data as a comma-separated value file (CSV) which includes the VTD unique identifiers from TIGER. Therefore it is possible to join the VGI data to the TIGER boundaries in GIS. Since these election data are provided by political bloggers they are ‘asserted’ rather than ‘authoritative’ to use Goodchild’s (2007) distinction.

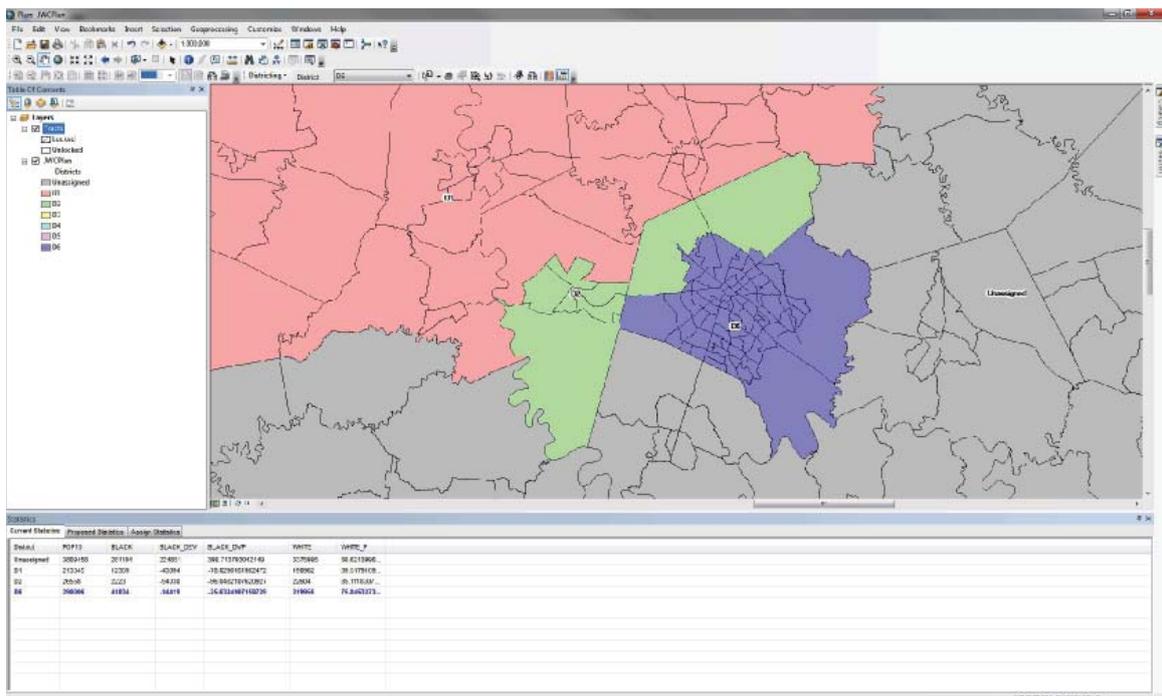


**Figure 2.** [In color online.] Redistricting with Dave's Redistricting App with running tally by voting tabulation district.

(This application is supported by the Progressive Congress Action fund and the Congressional Progressive Caucus indicating its left-liberal activist roots.)

### Case study 3: Esri Redistricting Add-On

Esri Redistricting is a free add-on for ArcGIS 9 and 10 (figure 3). This solution is far less accessible to the average citizen than the first two examples, but it is commonly found in educational settings. Users provide their own data and require basic knowledge of the software to perform the redistricting. Any geographies for which users have applicable data can be districted (VTDs, school districts, wards, etc) and is therefore the most flexible of the three examples. It provides running statistics on the new districts (eg, voting age population, percentage white, etc), allows easy identification of unassigned areas and allows users to lock



**Figure 3.** [In color online.] Esri Redistricting Add-On.

off certain areas from being split up (eg, communities of interest). Unlike case study 1 (the Azavea software) it provides no inherent compactness measures although of course users can perform geostatistical analyses using other functionality in ArcGIS. For example, once the districting plan has been created, it can be exported as a shapefile.

### Conclusions

Getting to ‘extreme’ rather than ‘normal’ citizen participation and VGI is a matter of moving beyond crowdsourcing and data provisioning to problem definition, data discussion, and analysis (Haklay, 2011). Crowdsourcing (supplying data or redistricting plans) is merely the beginning. Legislatures are under no inherent obligation to pay attention to them. But this does not obviate the advantages of VGI redistricting. As the software manufacturer behind case study 1 put it:

“A Web 2.0 approach to redistricting would enable citizens to work with real data in a user-friendly, game-like interface . . . . Web-based tools could make it possible for citizens and community groups to create their own redistricting plans, share those plans with others, assess the fairness of plans, vote on their favorite plans, and submit the best plans to their local and state redistricting authorities or legislatures” (Azavea, 2009).

VGI for political redistricting has come of age. Although the public were able to participate in the last round of redistricting, this was on a limited basis (eg, terminals in public libraries). Open access tools and data mean that the picture is now very different. Far from the fear of electoral manipulation or malapportionment, VGI opens the political process to many more stakeholders as well as individual citizens. VGI does not necessarily remove partisanship (although it is just as easy to create a competitive district as a partisan district). Nor does it remove fears by legal scholars of legal challenges or ‘poorly trained’ citizen commissions (Levitt, 2011). But surely the goal of politics is not to remove political positionality (eg, through supposedly neutral automated redistricting), but to include as many voices as possible (the Habermasian communicative democracy)? No doubt this is an impossible ideal. But nor should we pursue the chimera of ‘neutral’ automated redistricting. We are so far from citizen engagement in redistricting that any realignment of the political landscape is to be desired. The idea is not to transcend power, but to make it less elitist.

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