CASE STUDY #4

NORTH CAROLINA

Veronica Degraffenreid, Director of Elections Technology, shared the following information on how they are geo-enabling their elections as we speak in the state of North Carolina.

WHY?

Several years ago, we began using GIS data to help our one hundred county boards of elections audit their district assignments for state jurisdictions. These district assignments included county boundaries, precinct boundaries, congressional districts, state legislative districts, and state judicial districts. We compiled GIS data (address points and district boundaries) from several state sources such as our state's legislative body, the Department of Motor Vehicles, and the North Carolina Geodetic Survey to configure our audit tools.

Our agency provides our county boards of elections with two types of audits, the Interactive GEO Points Map Audit and the Weekly GIS Jurisdictions Audit.

The Interactive GEO Points Map audit is an on-demand web application that can be used by county board staff to maintain accurate address point locations for county voters. In this application, we identify the geopoint of any voter's address that appears to be assigned to the incorrect county or precinct. If the county user believes that the given geopoint of the address is incorrect, the user can drag the geopoint to the correct location on a map, thus assigning a new geopoint for the given address. If the county user believes that the given geopoint is accurate, but the district assignment is incorrect, the user should correct the address assignment in the Geocode module of our state's voter registration database and election management application. Either way, the flagged address will cease to display on the GEO Points Map audit in the future. This auditing tool has helped our agency develop a statewide address point database.

The Weekly GIS Jurisdictions Audit is initiated each week when the State Board of Elections emails a GIS audit reminder to the county boards of elections. Attached to the weekly email is a spreadsheet that identifies the number of flagged address records that are potentially incorrect in the Geocode application. These potentially incorrect address records could be caused by one of the following issues. The address records:

- do not have an assigned jurisdiction
- are assigned to the wrong congressional district
- are assigned to the wrong North Carolina House district
- are assigned to the wrong precinct
- are assigned to the wrong North Carolina Senate district
- are registered in the wrong county
- are assigned to the wrong prosecutorial district
- are assigned to the wrong superior county district

Further, the weekly jurisdictional audit provides the county boards of elections with shapefiles of the weekly audit data. Counties can use free applications like Google Earth to view the flagged address geopoints that are potentially out-of-district within the relevant district layer.

Corrections to district assignments must be made in our state's Geocode application. Currently, our state Geocode application requires county board staff to assign election districts to street segments. This process requires a county to identify its street locations using a third-party resource, such as the county or municipal GIS department, emergency 911 services, or the city and regional planning department. With respect to a manual street assignment, a county must first identify where a range of addresses on a street fit within the county boundary and the other relevant jurisdictional boundaries, then enter this information for the street range in the geocode jurisdictions assignment grid. For a county's geocode assignments to be accurate, each address within a given street segment must geographically lie within each of the assigned jurisdictions or districts.

For example, if a county is assigning a geocode for **100** E. Thompson Road, Somewhere, NC to **1000** E. Thompson Road, Somewhere, NC, all individual addresses within the 100 – 1000 range must lie geographically within the jurisdictional boundaries illustrated in the grid below. If all addresses within the range share the same jurisdictions, a county should first enter the range in the Geocode application, then assign the appropriate jurisdictions in the street assignment grid.

For demonstrative purposes, the jurisdictions for the 100 – 1000 E. Thompson Road range are entered with their proper district assignments as follow:

100 – 682 E. Thompson Rd.

PCT	VTD	CNG	SEN	HSE	PROS	SUP	JUD	COMM	MUNI	M DST	WARD	TWN	SCH	FIRE	WAT	SEW	SANI	RES
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

However, starting at address 1001, there is a variation in a jurisdictional makeup that prevents a county from extending the address range beyond 1000. Instead, the county must enter the addresses within the range of **1001** E. Thompson Road, Somewhere, NC to **2290** E. Thompson Road, Somewhere, NC as follows:

1001 – 2290 E. Thompson Rd.

PCT	VTD	CNG	SEN	HSE	PROS	SUP	JUD	COMM	MUNI	M DST	WARD	TWN	SCH	FIRE	WAT	SEW	SANI	RES
1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1

To continue this example, let's suppose that the county commissioner districts are later changed so that addresses beginning with 2000 E. Thompson Road are redistricted to county commissioner district #3. The former street range of **1001-2290** E. Thompson Road must be shortened to **1001-2000** E. Thompson Road.

1001 – 2000 E. Thompson Rd.

PCT	VTD	CNG	SEN	HSE	PROS	SUP	JUD	COMM	MUNI	M DST	WARD	TWN	SCH	FIRE	WAT	SEW	SANI	RES
1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1

The county must then create a new street range assignment for addresses beyond **2000** E. Thompson Road.

2001 – 2290 E. Thompson Rd.

PCT	VTD	CNG	SEN	HSE	PROS	SUP	JUD	COMM	MUNI	M DST	WARD	TWN	SCH	FIRE	WAT	SEW	SANI	RES
1	1	1	1	1	1	1	1	3	1	1	1	1	2	1	1	1	1	1

County boards of elections must constantly managing geocode assignments. New streets can be added to the county street files or an existing street can be extended if additional addresses are added. Further, district boundaries can be modified due to redistricting or changes prompted by litigation.

We use GIS audits to help county boards determine whether they have voters assigned to the correct jurisdiction. We provide a weekly audit from the state jurisdictional shapefiles that shows whether voters appear to be assigned to a district outside of their geographical region. We also provide the counties with several audit tools.

WHO?

In North Carolina, we agree that it is not productive to reinvent the wheel. We know implementing an election system that is integrated with GIS takes time, resources, and will. We also know that often much of the data required is already available, and you can learn precisely what by contacting other agencies and offices. We have partnered with the counties and GIS specialists to implement our current geo-enabled election system.

IMPROVEMENTS

In North Carolina, we are identifying opportunities for improvements and beginning to implement them. Currently, we are moving to a system that uses geopoints instead of address segments. We are also creating and updating a database of valid addresses in the state. We are standardizing addresses in the state and using a third-party vendor's system to identify the address point of valid addresses.

CHALLENGES

Of course, we encounter some challenges as we identify these opportunities for improvement. We must ensure, for example, that we have updated all local jurisdictional files. In addition, to the work we are completing at the state, we rely on county boards to audit on their own. The necessity to build and update our database of county addresses is constant.

SUCCESSES

North Carolina is humbled by the opportunity to offer advice to other states who are interested in or considering the process of geo-enabling their election systems. One piece of guidance we can offer is that you build an address database first and then gather jurisdictional shapefiles. Of the utmost importance is that you engage county and state GIS partners, including the Geographic Information Officer or state equivalent. In North

Carolina, we partner with the Director of the Center for Geographic Information and Analysis.

As we started down this road, we did not immediately consider the non-election related benefits of creating election geospatial data layers, such as Next Generation 9-1-1 or the National Address Database. However, access to good data is vital to any industry, government-related or otherwise. Partnering with other agencies and offices and sharing information is critical to everyone's success.

Please contact Veronica Degraffenreid if you have any questions. Thank you.

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