2010 GNIS Updates Final Report 1

Updating Cultural Features: West Virginia Schools

Submitted: 15 December 2010

Final Report

Agreement Number: G09AC00457

Proposal Title: GNIS Cultural Features Update Project for West Virginia: Schools

Contributors: Aaron High, Jessica Brewer, Eric Hopkins, and Kurt Donaldson

West Virginia GIS Technical Center

Administration/Contact: Kurt Donaldson, Manager, WV GIS Technical Center, Department of Geology and Geography, West Virginia University, 330 Brooks Hall, P.O. Box 6300, Morgantown, WV 26506-6300, Phone: (304) 293-9467, Fax: (304) 293-6522, E-Mail: Kurt.Donaldson@mail.wvu.edu , Web: http://wvgis.wvu.edu

Collaborating Organization: United States Geologic Survey

USGS Geospatial Liaison for West Virginia: Craig Neidig, E-Mail: cneidig@usgs.gov, Phone: (304) 347-5130

Data Themes: Structures and cultural features

GNIS Themes: Schools

Executive Summary: In collaboration with the U.S. Geologic Survey, the WV GIS Technical Center (WVGISTC) updated 168 school features in the national Geographic Names Information System (GNIS). The primary source for these updated features was the West Virginia Department of Education (WVDE), who compile an annual list of all open and recently closed school features. While this tabular list of schools proved extremely useful and provided the majority of our data, it lacked geographic coordinate information, having only address information. Many of these addresses could be located and validated remotely at the WVGISTC using new WV address locator services and aerial imagery. However, in some cases, when either no address was present, or a route-style address was used, validation became more difficult and outside resources were used, such as official websites of schools, phone interviews with school staff/faculty, and local knowledge experts. Beyond the scope of this agreement, additional verification and validation procedures were completed for schools throughout the state to ensure the most comprehensive data was available. Please see Appendix C for a description of these additional procedures.

Project Highlights

1) **Goals:** The main goal of this project is to support an ongoing activity for the state of West Virginia by continuing updates to GNIS for cultural features complementary to the existing Homeland Security Infrastructure Program (HSIP Freedom). The focus of this update was on school features, both public and private.

2) **Accomplishments:** Data was submitted to the GNIS via single entry method using the GNIS proprietary interactive web interface. There were 168 edits made to the existing GNIS data for the state of West Virginia's school features. These modifications to the West Virginia schools GNIS layer were generally in one of two forms: that of the addition of a new school feature or the change of an existing GNIS feature from "active" to "historical", indicating a closed feature. In some cases, the type of update was to create a "historical" feature as a new GNIS feature, meaning it is a closed feature that did not previously exist in the GNIS as an "active" feature.

3) **Challenges:** Though the support provided by the WVDE's tabular listing of open and closed schools was extremely beneficial, its lack of city-style addresses (in some instances), and coordinate information proved to be an obstacle in proper spatial placement of the features.As a result, a substantially more rigorous validation process had to be undertaken to properly spatially locate school features. (See *Data Reconciliation* section). In addition, even when city-style addresses were included, a considerable number of schools, in particular private schools, were still unable to be verified. As a result, the WVGISTC completed a time-consuming, yet effective process of contacting schools directly in order to have the most accurate data.

4) **Future Directions:** This project, and similar future federal-state-local collaborations, will help greatly in maintaining the GNIS so that it more accurately reflects the status and location of cultural features. Such activities may also stimulate more frequent and creative use of GNIS resources. This data, which changes frequently, must be updated on a regular basis to maintain accurate information.

5) **Recommendations:** Local knowledge is an extremely effective resource for spatial verification, especially in cases where addresses are absent or limited to route-style addressing information only.

    - Particular problems were encountered in the validation of rural schools in several counties. These issues stemmed from the mentioned route-style addresses in addition to the rural nature of the schools, making the features hard to locate and/or distinguish remotely. In these instances, telephone interviews with local school officials proved to be an invaluable asset to correct placement of the feature.

- While field-work was not undertaken on a large scale in this study, the ability to use local resources for field-validation in more rural, distant counties may help to ease the burden of remote validation.
- The presence of an official website for school features has been highly beneficial in the validation process, as they provide a quick valid reference (when up-to-date).
- Increasing the accuracy of the state addressing and mapping database will be helpful for future updates to features with addresses present.

6) Products

a. GNIS Database Updates

b. Full FGDC Metadata

c. Public Dataset for WVGISTC Dissemination

i. *This dataset will include all updated "open" school features, as well as all existing "open" school features, and will serve as a publicly accessible source of West Virginia schools information.*

d. Final Report

Schools Data Reconciliation and Validation

Updating the schools layer of the Geographic Names Information System, like any GNIS update, was a multifaceted and time-consuming process. The majority of the data were received as tables from the West Virginia Department of Education. Telephone interviewsand local field validation were also used in the validation process.

Step 1: Data Collection. Information was collected from the aforementioned WVDE listings, official internet homepages of school features, telephone interviews, and limited field checking.

Step 2: Data Reconciliation. Data reconciliation for the schools update proved to be a relatively labor-intensive operation, as many features had spatial identifiers which were not easily transmutable to a coordinate-based system. While data received from the USGS was already spatially identified using geographic coordinates, WVDE datasets were identified using primarily addresses. When possible, these features were spatially located using the WV Address Locator service.

Step 3: Data Validation. Through data reconciliation, features were placed spatially using geographic coordinates. If a feature did not have geographic coordinates present (such as with WVDE tabular data), the data were geocoded using the WV Address Locator service created from the Statewide Address and Mappingdata. All features were checked and validated to ensure proper locational information and citation, as well as name and citation. In many cases, the WVGISTC contacted schools directly and/or depended on local knowledge of county residents to further validate features. If after exhausting all possible avenues, it could not be ensured that a school feature had proper (and documented) information/attributes, it was not included in the update.Given that so many school locations were found to be incorrect, the WVGISTC made a decision to go beyond the scope of the project and implement further verification/validation steps as described in Appendix C-D.

Step 4: Data Submission. Data was submitted via interactive user mode (single-entry) remotely at the WVGISTC. The relatively manageable size of the update allowed for ease of entry into the GNIS through manual means, and provided a good basis for navigating the GNIS interactive user form.

Appendix A: Tables

Table 1: School Sources and Codes Used In This Study*

Originator	Type	Code	Citation
US	Text	147	Data received from the internet that is not applicable to US-T146, includes other e-mail received
US	Interview	1	Personal interview. Telephone call.
WV	Dataset	2	West Virginia GIS Technical Center. Field validation and visitation of features visible in aerial imagery. Features were physically validated and documented.
WV	Text	3	West Virginia Department of Education.
WV	Text	803	Newspaper, The Dominion Post, Morgantown, WV 26505-6298, published daily.

*Note: These source codes have since been replaced with a different citation system. References must be vetted with GNIS administrators.

Table 2: Updates Summary

School Type	New Feature	Historic Feature	Total
Private	41	27	68
Public Pre-K	1	0	1
Public Elementary	9	30	39
Public Middle	4	7	11
Public Elementary/Middle	2	0	2
Public Middle/High	1	2	3
Public High	3	7	10
Public Vocational/Technical	1	2	3
College/University	0	1	1
Other	17	14	31
Totals	79	89	**168**

Appendix B: GNIS Specifications and Qualifications (Fields and Definitions provided by USGS)

While data for this update were submitted via manual entry by the WVGISTC using the USGS GNIS web-entry form, stringent data formatting standards were still applied to created datasets. These standards mirror the methodology used for batch submission, and allow for ease-of-transfer from a shapefile format to entry in the web form. GNIS manual web entry requires properly formatted values for the following fields: Name, Primary Feature Code (type of feature, generally), Secondary Feature Code (type of feature, specifically), State, County, Reference Origin, Reference Type, Coordinates (as Decimal Degrees or Degrees-Minutes-Seconds), and comments. In order to access this web entry, the user must be issued login credentials from the USGS; for details on this, please contact the WVGISTC. Integral componentsof properly formatted GNIS data are bibliographic citations and their corresponding codes. These codes, assigned by the USGS GNIS, range from general national codes through state specific codes. When possible, the most detailed code applicable was used to list a citation.

Column Headings for Dataset Fields

(*Denotes an internal WVGISTC Field)

(+ Denotes a non-GNIS field for use in WVGISTC dataset)

	Field Name	**Description**
	Class	Type of feature, “school” in this case
	Name	The name of the feature
	Originator	Bibliographic citation origin (e.g. “US” or “WV”)
	Ref_Type	Type of reference (M,T,F,I,D): Map, Text, Field, Interview, Dataset
	Ref_Code	Official numeric GNIS code for the reference type
	Ref_Detail	Generally a date of citation, varies depending on reference type
	County_Seq	Integer indicating number of counties the point feature falls within (Generally 1)
	County_Name	Name of the county the point feature falls within
	State_Alpha	The two-letter alphanumeric abbreviation for the state the point feature falls within (e.g. “WV”)
	State_Num	Integer indicating number of states the point feature falls within (Generally 1)
	Lat_Dec	Latitude coordinate in decimal degrees, North American Datum 1983
	Lon_Dec	Longitude coordinate in decimal degrees, North American Datum 1983
	Lat_DMS	Latitude coordinate in degrees-minutes-seconds, North American Datum 1983
	Lon_DMS	Longitude coordinate in degrees-minutes-seconds, North American Datum 1983
	Description	Usually the address information of the point feature, may contain additional material
+	Subtype	Specific type of school, public middle, for example
*	NewFeature	Yes or No entry denoting whether the feature exists or existed in the GNIS at the time of the project

*	Comments	General text field for comments regarding the specific point feature
*	EditorInit	Text field for initials of the individual responsible for editing and verification of the point feature
*	GeocodeVal	Yes or No entry denoting whether the feature was successfully placed and validated using the WV State Address Locator Service
	Quad_Name	Text field indicating the USGS 1:24,000 Scale Quadrangle that the point feature falls within.

Appendix C: School feature verification and validation

In 2010, the West Virginia GIS Technical Center completed updates to the GNIS for schools within the state of West Virginia. In total there were 168 updates to the database. In conjunction with this project the WVGISTC created a website (www.mapwv.gov/schools/) and a collection of print-ready maps that identify school locations within the state via publicly available sources. As part of this process, the WVGISTC felt it was essential that the location of all 1090 of the state's public and private schools be verified in order to have the most up to date and comprehensive information available. The WVGISTC had neither the manpower nor funding to complete the verification process, as field visits spanning the entire state would have been required for the majority of schools. The WVGISTC therefore developed an online application and a collection of print-ready, downloadable maps as an alternative, effective system by which to verify the schools.

Beginning in fall 2010, a database was created that cataloged all 1090 schools. The location information for the schools was obtained via the West Virginia Department of Education and the most current shapefile within the WV Data Clearinghouse, which was also used as the base layer for the web application. The web application is an interactive site designed to allow the user to select any school in the state by county and to view its location and basic information within the context of street or topographical maps and aerial imagery.

Figure 1. Enlarged section of a WVGISTC created print-ready county-wide schools map.

The WVGISTC, in addition to the web application [www.mapwv.gov/schools] also developed 67-24"x36" county/city wide and 8.5"x11" individual school maps, available in pdf format via the web [http://www.wvgis.wvu.edu/resources/resources.php?page=mapProductsServices/schools] to help facilitate the identification of schools [see figure 1]. These maps are also publicly available as a part of the ongoing mission to actively maintain updates for educational listing throughout the state.

Once the web application and school maps were created, a list of contacts throughout the state was developed and instructions were sent via an email letter detailing the process required to verify each school. Please see Appendix D for a copy of this letter. The number of responses was not overwhelming (15 of 55 counties), but the feedback received was invaluable. Within the first round of response there were 17 modifications to the location of schools, and 6 changes in nomenclature, 11 status changes with 176 schools remaining unchanged.

After receiving responses from the initial contacts, another list of alternative contacts, mostly those within the county Board of Education for each county was created. Each of these were first contacted via telephone to make them aware of the program, and then emailed instructions to verify their

respective schools. The largest obstacle throughout the GNIS and verification projects has been the verification of private schools. Private schools are often very small, with only a handful of pupils, and can be operational within a private home or church, making the verification contacts difficult to find. The majority of deletions and additions to the database are as a result of opening and closing private schools.

While the second round of the verification process is ongoing, it is the hope of the WVGISTC to ultimately verify the majority of the schools in the state. Having correct school locations is not only helpful to the public who is seeking to find them, but ensures that public safety and emergency response entities also are aware of any modifications. While the idea is a somewhat simple one, to know where all the state's schools are located, the reality is that numerous schools are currently identified in the wrong location, have changed in status (have been closed, consolidated or opened somewhere else), or quite often have names or titles that are spelled or worded incorrectly.

The WVGISTC will ultimately submit any modifications to the GNIS in order to make the appropriate changes to their database. The following is a summary and the letter sent to contacts during the update process.

2010 GNIS STATEWIDE SCHOOLS UPDATES FINAL REPORT

VERIFICATION UPDATES SUMMARY

County	Contacted	Response	Location Modified	Status Change	Name Modified	No Change
Barbour	**Y**	N	N/A	N/A	N/A	**N/A**
Berkeley*	Y	Y	0	0	1	
Boone	**Y**	N	N/A	N/A	N/A	**N/A**
Braxton	**Y**	N	N/A	N/A	N/A	**N/A**
Brooke	Y	Y	1	0	1	**15**
Cabell	**Y**	N	N/A	N/A	N/A	**N/A**
Calhoun	**Y**	N	N/A	N/A	N/A	**N/A**
Clay	**Y**	N	N/A	N/A	N/A	**N/A**
Doddridge	**Y**	N	N/A	N/A	N/A	**N/A**
Fayette	**Y**	N	N/A	N/A	N/A	**N/A**
Gilmer	**Y**	N	N/A	N/A	N/A	**N/A**
Grant*	Y	Y	1	0	0	
Greenbrier	**Y**	N	N/A	N/A	N/A	**N/A**
Hampshire	Y	Y	1	0	0	**14**
Hancock	Y	Y	0	2	0	**14**
Hardy	**Y**	N	N/A	N/A	N/A	**N/A**
Harrison	**Y**	N	N/A	N/A	N/A	**N/A**
Jackson	**Y**	N	N/A	N/A	N/A	**N/A**
Jefferson	**Y**	N	N/A	N/A	N/A	**N/A**

Kanawha	**Y**	N	N/A	N/A	N/A	**N/A**
Lewis	Y	Y	1	2	0	**7**
Lincoln	**Y**	N	N/A	N/A	N/A	**N/A**
Logan	**Y**	N	N/A	N/A	N/A	**N/A**
Marion	**Y**	N	N/A	N/A	N/A	**N/A**
Marshall	**Y**	N	N/A	N/A	N/A	**N/A**
Mason	**Y**	N	N/A	N/A	N/A	**N/A**
McDowell	**Y**	N	N/A	N/A	N/A	**N/A**
Mercer	**Y**	N	N/A	N/A	N/A	**N/A**
Mineral	**Y**	Y	3	0	0	**15**
Mingo	**Y**	N	N/A	N/A	N/A	**N/A**
Monongalia	Y	Y	4	0	2	**39**
Monroe	**Y**	N	N/A	N/A	N/A	**N/A**
Morgan	**Y**	Y	2	0	1	**7**
Nicholas	**Y**	N	N/A	N/A	N/A	**N/A**
Ohio	Y	Y	2	1	1	**34**
Pendleton	**Y**	N	N/A	N/A	N/A	**N/A**
Pleasants	**Y**	N	N/A	N/A	N/A	**N/A**
Pocahontas	Y	Y	2	0	0	**5**
Preston	**Y**	N	1	0	0	**13**
Putnam	**Y**	N	N/A	N/A	N/A	**N/A**
Raleigh	**Y**	N	N/A	N/A	N/A	**N/A**
Randolph	Y	Y	3	1	0	**17**
Ritchie	**Y**	N	N/A	N/A	N/A	**N/A**
Roane	**Y**	N	N/A	N/A	N/A	**N/A**
Summers	**Y**	N	N/A	N/A	N/A	**N/A**
Taylor	**Y**	N	N/A	N/A	N/A	**N/A**
Tucker	**Y**	N	N/A	N/A	N/A	**N/A**
Tyler	**Y**	N	N/A	N/A	N/A	**N/A**
Upshur	Y	Y	1	5	1	**9**
Wayne	Y	Y	1	0	0	**22**
Webster	**Y**	N	N/A	N/A	N/A	**N/A**
Wetzel	**Y**	N	N/A	N/A	N/A	**N/A**
Wirt	**Y**	N	N/A	N/A	N/A	**N/A**
Wood	**Y**	N	N/A	N/A	N/A	**N/A**
Wyoming	**Y**	N	N/A	N/A	N/A	**N/A**

*There are a couple of schools in these counties that were not able to be verified by our contacts.

Appendix D: Verification letter sent to local reviewers

From: The West Virginia GIS Technical Center

Date: October 21, 2010

Re: School Locations

Dear County Representative,

Greetings! The West Virginia GIS Technical Center at West Virginia University has spent several months updating schools in the Geographic Names Information System [GNIS], the official Federal and national standard for geographic nomenclature created by the US Geological Survey. As a component of this project, we have reorganized our *Google Map for West Virginia Schools* website [www.mapwv.gov/schools], to reflect these updates. In the process of completing this project we found errors with the location of several schools. While some of these have been corrected, there are still inconsistencies. We would appreciate your help in verifying features in your area. In short, no one knows your schools better than you. With your help, we hope to have a comprehensive and accurate dataset that is available to the public and benefits anyone seeking information about the educational facilities in our state.

The following instructions will help as you validate schools in your area:

1) Navigate to the *Google Map for West Virginia Schools* website www.mapwv.gov/schools
2) There is a pull down menu that will appear at the top left-hand corner of the site's main page. Please select the county in which you are verifying the location of a school [Figure 1].
3) After selecting a county, select among the listed schools for that area. It is not necessary to select a city, as we do not have all of them listed as of yet.
4) The key components that we want your feedback on are:
   a. Listing: Is your school listed within the system? Is the name used, the correct name?
   b. Location: Is your school in the correct physical location? Please utilize the street *Map* and *Photo_09* tabs at the top right-hand corner of the map [Figure 1]. Ensure the street is correct as well as verify that the school corresponds to the correct building.

Figure 2

c. Note that a latitude and longitude coordinate is given for the point [Figure 2]. If the point is incorrect, clicking on the correct point on the map modifies these coordinates to reflect the new location. Please copy and paste these correct coordinates and send them with your response so that we may update the location accordingly.

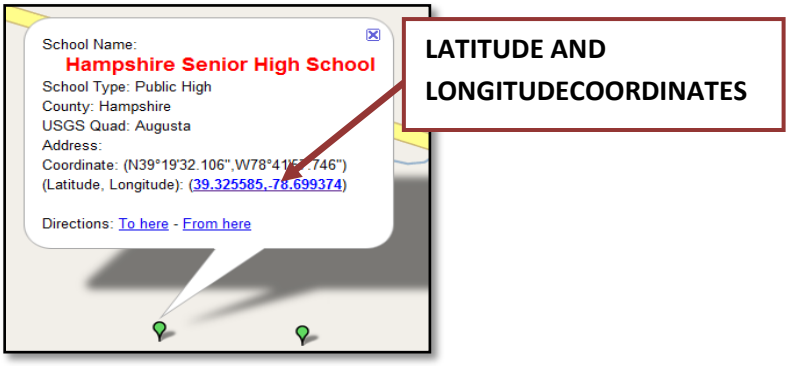

Figure 3

d. Spelling: Is the school name spelled correctly?

e. Designation: Is the appropriate pin color associated with the school? [Green: Public; Yellow: Private; Red: College or University]

5) Please respond via email or phone call to Jessica Brewer [jbrewer1@mix.wvu.edu or 302-293-0557], identifying any errors in your school information. If all information, as well as the location is correct, we would also appreciate a confirmation for our records.

We appreciate you taking a few minutes out of your busy schedules to ensure the most accurate data is available. In addition to the benefit of having the information publicly accessible, it aids in the security and safety of our children and educators in the event of an emergency, ensuring agencies such as fire and rescue teams can reach facilities in a minimum amount of time. Once again, we thank you and encourage you to contact us with any questions, suggestions or concerns.

Sincerely,

Jessica Brewer
WV GIS Technical Center
WVU Department of Geology & Geography
330 Brooks Hall
PO Box 6300
Morgantown, WV 26506
Phone: (304)-293-0557
Fax: (304)-293-6522
Jbrewer98@gmail.com or jbrewer1@mix.wvu.edu