

Statewide Mapping Advisory Committee Meeting

Minutes

Wednesday, October 17, 2018; 1:30 PM – 3:30 PM

**NC Department of the Secretary of State
4701 Atlantic Avenue, Raleigh, NC 27604**

Welcome/Introductions – Paul Badr, Chair, called the meeting to order and welcomed Alice Wilson, Hope Morgan, Rich Elkins, John Bridgers, Cam McNutt, John Farley, Gary Thompson, Kenneth Taylor, Sean McGuire, Jeff Essic, Bob Coats, Silvia Terziotti, David Giordano, Jeff Brown, and on the phone Ben Shelton, Marcus Bryant, Drew Pilant, Steve Averett, and Stephen Dew. Zsolt Nagy attended as a visitor.

Minutes

The committee approved the July 18, 2018 minutes as written. Mr. Brown confirmed that it has been a standard practice to include a list of visitors in the SMAC minutes.

Framework+ Datasets

Mr. Badr called on members to report on opportunities, development, maintenance, and issues for Geospatial Framework-Plus datasets for North Carolina.

- *ORTHOIMAGERY*

Ben Shelton (CGIA) provided a brief status report on the Statewide Orthoimagery Program funded by the NC 911 Board.

- The 2018 Northern Piedmont and Mountains project has completed the VOICE (Virtual Online Inspection Checking & Editing) visual quality review for all 26 counties, including 30 Public Safety Answering Points (PSAPs).
 - 59 percent of all tiles were reviewed; 7,647 of 8,124 tiles reviewed passed the first time, a pass rate of 94 percent. Issues identified, numbering 652, were resolved by contractors. Calls were fairly evenly distributed across the project area, as issues varied.
 - Looking at a chart of pass rates since 2012, the 2018 project results were comparatively good.
- CGIA received the first set of counties as final deliverables from contractors, to be followed by two more deliveries over the next two weeks, ending on 11/1.
- The project team is validating the first delivery and assembling final products.
- Horizontal quality control is underway, led by Gary Thompson.
- The goal is for delivery meetings to be held starting the first week of December, with the NC OneMap image service created at that time.

Mr. Shelton explained that, for Greensboro and Winston-Salem downtown areas, the project had specifications for increased flight lines and processing of true orthoimagery. This removes all building lean from structures over 40 feet tall. In an example, he pointed out the breaklines used for true ortho processing. Extra files will be on the final

hard drive delivered to the PSAPs, so the counties can use the files for building footprints, 3-D modeling, and other end-uses. True orthoimagery extra deliverables besides imagery will be a 3-dimensional computer aided design (CAD) file of breaklines used for true ortho processing (.dgn file for overall area), and a digital surface model used for true ortho processing (.dtm files for each building).

The 2019 project is in progress. The project includes 21 counties covering 10,397 square miles. 50 percent of project area is classified as mountain tiles. True orthoimagery areas of interest are Charlotte and Asheville.

The Qualifications-Based Selection (QBS) is in progress. In response to a Request for Qualifications, proposals were received at the end of August and the scoring team selected 4 vendors: Atlas Geographic Data, Inc., the Sanborn Map Company, Inc., Spatial Data Consultants, Inc., and Surdex Corporation. Vendors will use frame cameras, except for Surdex that uses a push-broom sensor. Cost proposals and negotiations will be completed at the end of October, with contracts in place for a kickoff meeting in the middle of December. The expected acquisition season will begin at the end of January or beginning of February, continuing into April.

Mr. Shelton added that the new section of the ortho program website is live. It details buy-up or “cooperative” products available for local or county governments that may be produced on top of the regular 6-inch orthoimagery product. The website has examples of products that were created alongside the statewide ortho program. He encourages anyone looking for additional products to review this material. Mr. Shelton explained that plans and inquiries for 2019 cooperative products by local governments may begin in November after vendor assignments to study areas are clear.

He also explained that a 4-band product may be requested as a cooperative product. As discussed in previous SMAC meetings, the NC 911 Board would not benefit by spending extra on color infrared imagery, and another funding source to extend the products to include the 4th band to meet other business needs has not been forthcoming.

Drew Pilant added that it may be practical to pan-sharpen the true color orthoimagery from the NAIP 4-band imagery to produce a color infrared product for some business needs. Silvia Terziotti inquired about color balancing and Mr. Shelton’s understanding is that color balancing for Statewide Orthoimagery does not account for the 4th band.

There was also a discussion about the wealth of imagery collected in response to Hurricane Florence, including imagery from numerous military assets and unmanned aircraft systems (UAS) as well as videos. NOAA’s timely oblique imagery in impact areas was noted. Also, during future events, Gary Thompson expects to see a UAS coordinator stationed with the event “air boss” to help control air traffic.

- *CADASTRAL*

John Bridgers (Working Group for Seamless Parcels) reported that 42 counties have updated their parcels in the NC Parcels Transformer during the fall update cycle. Another

20 counties had their last update in the summer, before September. More outreach is in progress. There have been delays for some counties that have been busy with storm recovery. NC Parcels refreshed many of the eastern counties from readily downloadable source parcel data prior to the arrival of Hurricane Florence. The project team will give extra attention to counties that last updated in 2017. There is no specific timeline for updates; most counties will have updated parcels with ownership data to share before December. Mr. Bridgers explained that the timing of county processing internally is quite variable. Those inconsistencies make it hard for a third party such as a council of governments to coordinate data sharing by its constituent counties. Semiannual updates are requested by NC Parcels, but Mr. Bridgers recommends quarterly updates to coincide with the NCID 90-day password change requirement. While some counties may be capable of setting up a sophisticated technical solution for pushing data from a county to the state on a regular basis, experience with varying systems and security measures indicates that a comprehensive automated solution is not practical at this time. Uploading to the NC Parcels Transformer (53 counties) or transferring zipped shapefiles to an FTP site are relatively easy options that support consistent data acquisition.

The working group plans to follow up with the Local Government Committee and Piedmont Area Regional Transportation (PART) to learn more about how NC Parcels were used in a 9-county area with planning software. Mr. Brown reminded the committee that the NC Parcels team invites state agencies to let them know of special or urgent projects involving a set of counties where coordination efforts could accelerate updates.

- *ELEVATION*

Hope Morgan reported for the Department of Public Safety, Division of Emergency Management (NCEM) on North Carolina LiDAR. For Phase 4 LiDAR collected with a Geiger Mode sensor, all 20 counties have been finalized and are downloadable from NCEM's Spatial Data Download website. A series of issue papers for Phase 4 are about to be released. Geiger sensor questions are included. The papers will be available from the data download site by the end of November.

Phase 5 is in progress, with 19 of 21 counties delivered for quality control. Half of those counties (from Ashe to Buncombe) have been reviewed and vendors are producing derivative products for them. The goal continues to be to complete review by the end of 2018, and release data for download by March 2019. USGS is contributing funds toward Phase 5 and will also review the files. Products will include digital elevation models (3.125-, 10-, and 20-foot spacing) and intensity imagery and terrain datasets, the latter based on model key points instead of 8 points per square meter. Issue papers will explain details about the datasets. Products in 2019 will include statewide digital elevation models. Ms. Morgan added that LiDAR data must be accurate vertically within 10.0 centimeters (Random Mean Squared Error) to pass quality control.

Also, NCDOT and NCEM plan to do research on classified LiDAR at 30 points per square meter including intensity imagery. Derivative products will be tested at 30-point and 8-point densities. Potential business applications include inventorying roads, classifying wetlands, streams, impervious surface, and land cover. Testing and cost

estimations will be included. From the same data collection, 30-point data were calibrated differently from the 8-point data.

Alice Wilson expressed appreciation for statewide elevation data after her experience supporting search and rescue teams in New Bern and neighboring small towns in response to Hurricane Florence. A dataset as simple as 2-foot contours from NC OneMap offered enough information to guide teams to likely passable roads to respond to calls by stranded residents. She also used “spot-on” floodplain data, and building footprints were valuable. She acknowledged that GIS and elevation-related datasets can save lives.

In response to a question from Ms. Terziotti, Mr. Farley added that NCDOT is mapping culverts (72-inch diameter and greater) and drainage pipes (18-inch or greater). The second phase of the inventory is expected to start after catching up on tasks related to Hurricane Florence.

- *HYDROGRAPHY*

Cam McNutt of the NC Department of Environmental Quality (DEQ) opted to report on hydrography plans in his working group report, below.

- *GEODETIC CONTROL*

Gary Thompson reported that none of the Continuously Operating Reference Systems (CORS) were damaged during the storms. In addition to usual tasks, NC Geodetic Survey is collecting data in support of National Geodetic Survey and its modeling, including Global Navigation Satellite System (GNSS) data on benchmarks. Absolute gravity will be collected next month in mountain locations.

- *GOVERNMENTAL UNITS*

Regarding county boundaries, Gary Thompson reported two bills passed in the General Assembly. House Bill 1082 was ratified to establish the Wake-Chatham-Harnett corner boundary and House Bill 1076 was ratified relating to the Alamance-Guilford boundary. Geodetic Survey is following up with affected property owners.

Regarding municipal boundaries, John Farley summarized information from the Working Group on Municipal Boundaries (see full report by Bob Coats, below).

- *TRANSPORTATION*

Mr. Farley explained that the biggest issue for NC Roads data maintenance is geospatial data collection for local roads by NCDOT and how work by a geospatial vendor, to be selected for NextGen911, will fit into the process. He anticipates overlaps at first, but he envisions a single authoritative centerline dataset for common use.

- *ADDRESSES*

David Giordano (CGIA) reported that the NextGen911 requirement for address data and the hiring of a vendor for geospatial data acquisition means that *AddressNC* will collaborate with the vendor on data acquisition for NextGen911.

Working Groups

Working groups reported on activity in the last quarter.

METADATA COMMITTEE

Jeff Brown reported on behalf of Sarah Wray, chair of the Metadata Committee. Since the last SMAC meeting, Dr. Timothy Mulrooney led a full-day hands-on training session for metadata, hosted 10/16/2018 at North Carolina Central University. Ms. Wray has led NCDOT efforts to draft a new step-by-step manual for editing metadata using ArcCatalog software. She will ask the Metadata Committee to review and edit the manual. The plan is to schedule in-person, hands-on training using the new manual in locations around the state.

HYDROGRAPHY WORKING GROUP

Cam McNutt (NCDEQ) reported that the working group held several meetings during the summer. An in-person meeting was scheduled for September 13, but Hurricane Florence intervened and diverted attention away from hydrography tasks.

Mr. McNutt called on Zsolt Nagy of AECOM to confirm that the Division of Water Resources and contractors are making progress on hydrography data that cover most of the state. The hydrography product is a first-phase representation of hydrography to meet the immediate needs of the NCDOT project called Advanced Transportation through Linkages, Automation and Screening (ATLAS). The approach for the geometry is to combine the Headwater Streams Spatial Dataset (HSSD) with data that simulate streams from the Floodplain Mapping Program in the low lying flat areas where HSSD models are not sufficient. More work on topology is in progress. He emphasized that the product will serve the ATLAS program this year for purposes of protecting surface water, but future phases envisioned by the Working Group will add more attribution and stream events, followed by integration with the National Hydrography Dataset (NHD).

Mr. Badr requested a demonstration of the hydrography product at the next SMAC meeting.

ORTHOIMAGERY AND ELEVATION

Gary Thompson reported the working group met October 10 and reviewed the status of Statewide Orthoimagery. The group also discussed the National Agriculture Imagery Program (NAIP). It appears that planned collection of statewide imagery over North Carolina started late, and acquisition of 1-meter leaf-on imagery took place over only a small portion of North Carolina by the end of September. The group will seek more information on NAIP status.

Hope Morgan suggested that the working group lead an effort to sort out the many

sources of imagery acquired in response to Hurricane Florence to document what organizations acquired what images, including video, and lessons learned from using imagery during and after the event. The outcome would be better planning and procedures about acquiring, processing, sharing and using imagery. Controlling air traffic was a challenge considering the many airplanes, helicopters, and unmanned aircraft systems. The working group can help prepare for a larger exercise involving national organizations including military participants.

Related discussion included options for storing imagery in the cloud as well as tools for predicting the extent of floodwaters. Ms. Wilson's concern about small towns and flooding led to a discussion of NC Emergency Management's online FIMAN tool that includes flooding scenarios around some stream gages. More gages and more scenario libraries are needed and are in progress. Mr. Thompson added that NCEM is involved in testing and evaluation of low-cost sensors by the Department of Homeland Security. It may be an option for a small town to install a sensor for monitoring stream height. Mr. Badr added that NOAA has online tools for viewing coastal flooding scenarios. Ms. Wilson suggested that even simple GIS analysis of elevation can be valuable during an event, but small towns may lack GIS capability and need quick assistance to inform response efforts. Silvia Terziotti added that USGS typically adds gages as requested by FEMA in preparation for a storm event, but it is hard to anticipate where flooding will occur.

NC BOARD ON GEOGRAPHIC NAMES

David Giordano reported on behalf of Tim Johnson, interim chair. He presented case summaries from the NCBGN meeting on September 12.

Jincy Spring Case Summary:

The new commemorative name Jincy Spring is proposed for a spring at the head of a stream proposed as Jincy Creek (Review List 430). The name would commemorate Jincy Alspaugh Griffith (1825-1855), who lived near the spring with her husband Alexander in the 1840s. Mrs. Griffith's grandfather founded the nearby Bethel Methodist Church where she is buried. The Griffith family and its descendants have owned land near the source of the stream since 1846, and the intended honoree's great-granddaughter resides there currently.

The proposal for Jincy Creek (Review List 430) was initially submitted as Jincys Spring but was later amended once the proponent realized that springs and streams are distinct geographic features. He believes that because the spring served as an important source of water for early settlers, both it and the stream that flows from it warrant official names.

NCBGN Decision: Neutral

Katys Creek Case Summary:

The new name Katys Creek is proposed for an unnamed 0.4-mile-long tributary of Miller Creek in Davidson County. The name would commemorate Catharine “Katy” Woosley Crouch (1844-1922), who along with her husband John built a log cabin within 200 feet of the spring located at the head of the stream, where they farmed and raised 13 children. The unnamed spring is proposed to be named Katys Spring (q.v.).

NCBGN Decision: Approved with the recommendation to remove the “s” in the name, making it Katy Creek.

Katys Spring Case Summary:

The new name Katys Spring is proposed for an unnamed spring in Davidson County, at the head of an unnamed stream proposed to be named Katys Creek. As with the proposal to name the stream, the name for the spring would commemorate Catharine “Katy” Woosley Crouch (1844-1922), who lived near the spring, which was modified and protected to provide water for their domestic use.

The proponent believes that because the spring served as an important source of water for early settlers, both it and the stream that flows from it warrant official names.

NCBGN Decision: Neutral

In discussion, Mr. McNutt added that the board interpreted the spring to be the origin point of the stream and redundant as a namable feature. Also, a spring of this size and nature is hard to identify for mapping and regulatory purposes. Ms. Terziotti recommended that, even if neutral, NCBGN should recommend that if the spring is named, the name should drop the “s” to be consistent with the stream: “Katy Spring.”

Tilleys Mill Pond Case Summary:

The new name Tilleys Mill Pond is proposed for a one-acre reservoir located along Buffalo Creek in northeastern Stokes County. The name is intended to commemorate Edmund Tilley (1783-1870), who settled in the area around 1810, where he acquired property and worked as a wheelwright, wagon maker, and general blacksmith. His son established a water-operated sawmill on the site where they processed wood for their wagon manufacturing. According to the proponent, the Tilley family operations helped build and support the small community.

NCBGN Decision: Not Approved. Feature is ephemeral in nature. Recommendation is to name the creek that will eventually be present at this site.

Voted: SMAC approved submission of the four recommendations of the NC Board on Geographic Names to the US Board on Geographic Names.

Mr. Giordano added that on October 11, the USBGN approved two names in North Carolina, Griffith Mill Pond (Forsyth County) and Tilley Mill Pond (Surry County). The NCBGN was neutral on those names, but USBGN exercised its prerogative to approve for addition to the Geographic Names Information System (GNIS).

2022 REFERENCE FRAME WORKING GROUP

Gary Thompson, chair, reported that he is coordinating with the National Geodetic Survey (NGS) to do presentations and develop papers for various professions to explain the 2022 Reference Frame and the changes to expect. He noted an impact to land records management in North Carolina where a shift in state plane coordinates will mean that a parcel identification number (PIN) constructed from digits of state plane coordinates of a center point within a parcel will have new digits following the same convention. In some counties, parcel PIN is also used by the register of deeds as an identifier.

The working group will develop proposals to National Geodetic Survey to mitigate impacts. The group will prepare a recommendation for North Carolina by spring for review by SMAC and the GICC. NGS and software vendors are working on translations from NAD1983 to the 2022 Reference Frame.

WORKING GROUP FOR LAND COVER

Kenneth Taylor, chair, invited comments on the 25-page report from the Working Group for Land Cover (distributed to SMAC on July 3 and again on October 10). He has asked the working group to send the survey to more contacts for a larger sample to confirm or refute what he sees as bimodal results regarding the land cover cell size required for business needs. He sees business needs requiring resolution of 1-meter or better for smaller geographic areas and resolution of up to 30 meters for regional purposes. He referred to page 22 of the report as an example.

For local governments using land cover data, particularly impervious surfaces, for purposes such as stormwater management, cell size smaller than 1-meter is most suitable. He noted that using land cover data to analyze change in impervious surfaces informs local government planning.

Most business needs found to date relate to identifying land cover changes that affect water quality, stormwater management, wildlife habitat, wetlands, floodplain management, property tax appraisal, timber management, land conservation planning, and land use planning. Annual year-to-year comparisons are favored. The change of most concern is the change from forest cover or farmland to a developed or impervious cover.

In addition, the report shows the need to pursue research on sources of imagery to be classified, tools and techniques of classification, and strategies for targeting land cover

products to satisfy business needs identified in the report. What product is worth producing, for what geographic extent(s), and how?

The Working Group seeks guidance from the Statewide Mapping Advisory Committee to continue research on the “how.” How can land cover products be created and applied to the business needs across the state? Hope Morgan advised research on land cover products that are being produced commercially or by government agencies currently. A list would include but not be limited to NOAA’s 1-meter coastal land cover data, and US EPA’s 1-meter urban land cover product. Sean McGuire pointed out that the forthcoming National Land Cover Data 2016 from USGS (30-meter resolution) will play a role in meeting large-area/statewide business needs with its popular classification scheme and land cover change (5-year) products. LiDAR data may be part of a solution as well, particularly for higher resolution land cover analysis in areas of interest.

Drew Pilant observed that, using Google Earth Engine and 1-meter NAIP color infrared imagery, land cover can be produced in an automated way, but manual intervention may be needed depending on the number of land cover classes and other quality factors that can be improved with extra work. A product, for example, could be statewide land cover change for a 2 or 3-year interval based on NAIP imagery.

Dr. Taylor added that the working group has not had an opportunity to interview users to learn more about how land cover products are created in local governments as well as in federal agencies and universities. He suggested the working group will be ready to report again at the April SMAC meeting.

WORKING GROUP FOR MUNICIPAL BOUNDARIES

Bob Coats, serving as co-chair with John Bridgers, reported that the group has had good discussions and identified items to research. The group has had good participation from members in local and state government and the NC League of Municipalities. To reach more stakeholders in state government, the group sent out a survey to state GIS coordinators to learn more about what data (geospatial and tabular) are requested by state agencies from municipalities.

In discussing ways to improve data flows and communication, the group developed an approach, distributed to SMAC last week as an interim report. Mr. Coats explained nine steps leading to a recommendation to SMAC in January.

1. Proceed in phases that use guidance, best practices, outreach, and promotion first, followed by specific new requirements in administrative rules as needed to support best practices, followed by proposed statutory languages for specific elements that need a mandate to be successful
2. Define a process for uploading local government municipal boundary geospatial data to the State
3. Promote the reporting of municipal boundary changes by county GIS coordinators for their constituent municipalities to the State
4. Accept reporting directly from municipalities where a county submission is not practical (or until consolidated submissions are achieved)

5. Select a pilot group of willing municipal and county GIS coordinators to test a proposed new data flow
6. Evaluate the test results and modify a recommended process flow
7. Consider ways to modify guidelines and best practices to improve the quality of submissions of boundary changes, from the quality of plats to digital geo-referenced files and related metadata
8. Identify and update definitions in guides for boundary change submissions (e.g., define an “accurate map” in terms of current land surveying and digital mapping practices)
9. Recommend roles, responsibilities, a data process flow, requirements, decision points for phases, and a timeline

Mr. Coats intends to consult with the Local Government Committee and learn more from local governments to refine the approach.

He added that the Office of State Budget and Management is grateful to have been informed by geospatial data and analysis related to Hurricane Florence, and this is a good time to look for ways to improve geospatial data management.

Mr. Badr thanked Mr. Coats and Mr. Bridgers for the thorough job to date and asked the working group to proceed with its approach.

Regular Status Updates

NATIONAL GEOSPATIAL PROGRAMS OFFICE

Silvia Terziotti reported the 3D Nation elevation study is in progress with a compilation for North Carolina expected this month. A workshop is planned for early December that will include survey respondents and perhaps others.

NC ONEMAP

David Giordano explained a new way to download tiles of orthoimagery from NC OneMap. The original tool that enabled users to draw a box and download tiles touching that area of interest is broken. Attempts to fix it have not been successful. Instead of taking more time finding a solution for the old tool, CGIA created a routine that enables users to download one tile at a time (image file and world file) as a temporary solution. He demonstrated the download tool online. County mosaics are still available for download, but the files are larger than some consumers can handle efficiently. The downloadable tiles are in MrSID format with 20:1 compression. He sent messages to listservs to explain the change.

Work Plan Update

Mr. Badr called attention to the draft 2018-2019 SMAC Work Plan circulated to members last week. Mr. Brown explained that the updated Work Plan includes tasks identified by the Management & Operations Committee to implement strategic elements developed by the GICC.

Hope Morgan volunteered to lead SMAC efforts regarding research on infrastructure data policies (item 4.3) and involve colleagues and other stakeholders. In a parallel effort, the Local

Government Committee is gathering information from local governments, including policies and agreements. This topic includes local government utilities as well as private companies, risks and costs, and data issues that include versioning and implications of misleading or misinterpreted infrastructure data.

SMAC combined Item 4.5 with Item 3.2, both related to application of address points and roads for services such as address validation and vehicle routing, with Tim Johnson as the lead member. A lead member will be identified for Item 4.4 (solutions to make data sharing more efficient) by next SMAC meeting, after more information is available from the emerging NexGen911 geospatial data management.

Voted: SMAC approved the Work Plan for 2018-2019 with revisions specified in the meeting.

Adjourn --The meeting adjourned at 3:34 PM.

2019 SMAC Meeting Dates

Wednesdays, January 23, April 17, July 17, and October 16

Time: 1:30 PM

Location: Secretary of State's offices on 4701 Atlantic Avenue