Statewide Mapping Advisory Committee Meeting

Minutes

Wednesday, July 18, 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, Sarah Wray, Lucy Brady, Sean McGuire, Bob Coats, Tim Johnson, Ben Shelton, David Giordano, Jeff Brown, and on the phone Camille Tyndall Watson, Drew Pilant, Steve Averett, and Stephen Dew. Luiz Cortes and Zsolt Nagy joined the meeting as guests.

Minutes
The committee approved the April 18, 2018 minutes as written.

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 Northern Piedmont and Mountains (2018) phase held a vendor workshop to compare samples of imagery from the four imagery acquisition contractors and identify minor adjustments to achieve visual consistency in overlap areas. Contractors provided imagery services for review of adjustments, and results were satisfactory. Mr. Shelton displayed a list of local government buy-up products in coordination with contractors in their respective study areas. In response to a question about 3-inch imagery for the Town of Boone, the contractor switched from a "push-broom" sensor to a frame-based sensor over Boone to enable creation of planimetric data using stereo pairs.

Visual quality review using the VOICE tool (Virtual Online Inspection Checking & Editing) will begin July 30. The phase includes 26 counties and 30 Public Safety Answering Points (PSAPs). The first vendor deliveries of imagery to be reviewed are scheduled for next week. A training webinar on July 24 will go over the workflow for local government imagery reviewers. In a separate workflow, NC Geodetic Survey manages horizontal quality control. The 2018 project is on schedule to deliver imagery products to PSAPs in early December, with services published via NC OneMap shortly after.

For the 21-county Southern Piedmont and Mountains (2019) project, fifty percent of the region is considered mountainous which will affect flight planning and acquisition. Next on the timeline is the Qualifications-Based Selection (QBS) process beginning this

month. Mr. Shelton confirmed that seamlines are a deliverable and are published via NC OneMap.

Hope Morgan requested a shapefile of locations where contractors had an issue with a digital elevation model as in previous years. Mr. Shelton will send her the 2017 information and make a note to share the 2018 version when it is ready.

Digital elevation models (DEM) used in orthorectification are typically 10-foot DEM from NC Emergency Management. Mr. Shelton also explained that "true" orthoimagery will be applied for tall buildings in Greensboro and Winston-Salem to make the ground adjacent to buildings visible, and the project team has requested copies of digital surface models applied in those areas.

- *CADASTRAL*

John Bridgers (Working Group for Seamless Parcels) reported that 87 counties updated their parcels in the NC Parcels Transformer during the spring update cycle. The remaining 13 have various reasons for not updating, including staff vacancies, ransomware issues, and infrequent tax data updates. Persuasion is the method for about 25 counties that do not have downloadable data, do not run the Transformer themselves, and need to transfer a shapefile for an update. Status maps may be shared with groups including the NC Property Mappers Association.

Among benefits, SMAC members Steve Averett, Stephen Dew, and other county GIS coordinators pointed regional planners to NC Parcels for parcel data for a 9-county region. Collaboration with Piedmont Area Regional Transportation (PART) avoided duplication of effort and provided timely updates from member counties. Mr. Bridgers also pointed out the benefit to a county of having a copy of its parcels on NC OneMap in case of a natural disaster or other event that prevents public access to local parcel data.

In response to a question from Ms. Morgan, the committee discussed the pros and cons of a legislative mandate for counties to share parcel data and/or other geospatial data versus the current practice of non-mandated data sharing. Members acknowledged that in either case the State would need to assist some local governments, as local technical capabilities and staffing vary.

Mr. Johnson explained that Next Generation 911 development in North Carolina changes the context for local data sharing with state programs. Data acquisition will focus on multiple local government datasets including roads, addresses, emergency services areas, and PSAP boundaries. NextGen911 relies on the incentive of compelling local and state business needs, without a state mandate.

Ms. Wilson inquired about web services that are more common now. For services to represent statewide features, local source datasets and service capabilities would need to be standardized locally. The current approach with parcels is to translate local data to a standard and publish services from the standardized collection. Local input in a process is essential, as discussed in recent SMAC meetings. The Local Government Committee

may be consulted about an effective process for data sharing.

Data sharing has been part of recent GICC discussions, and Mr. Badr will include this topic in his report to the Council on August 3 for more attention.

- *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. All but one county has been reviewed by funding partner US Geological Survey (USGS). Minor issues in a handful of tiles in four counties will be fixed. Metadata errors identified by the USGS parser based on the Content Standard for Digital Geospatial Metadata are being addressed.

Phase 4 LiDAR data are downloadable from the NCEM's Spatial Data Download website. A few tiles may be replaced based on minor issue resolutions. Ms. Morgan is working through a series of issue papers for Phase 4.

Considering the relatively large files being produced for Phases 4 and 5 data, compression of tiles is in progress, using the open source LAZ format is acceptable to USGS and will work for data download. Compressing all LiDAR data for the state will take time.

Phase 5 is in progress, with expectations that all files will be in review by September, review will be completed by the end of 2018, and data will be available for download by March 2019. Files in Phase 5 are larger than Phase 4, in part because of vegetation in the mountains as well as refined methods with the sensor. Review needs to occur on portions of counties instead of whole counties for disk space requirements. As before, automated ground data will be provided for orthorectification in the 2019 orthoimagery project. Also, NCDOT and NCEM are working on an agreement related to research on classified LiDAR at 30 points per square meter including intensity imagery.

In a discussion of derivative products, Mr. Brown confirmed that CGIA plans to publish web services for 10-foot digital elevation models (DEM), slope and other representations of elevation based on copies of 10-foot DEM when Phase 5 is complete. CGIA is prepared to integrate data from Phases 4 and 5 into NC OneMap services. The delay in publishing services for Phases 1-3 has been to avoid removing services for contours (based on legacy elevation data) that are popular among NC OneMap data consumers—private and public—but would not be consistent with other elevation services based on current data. Mr. Giordano and Ms. Wray agreed that the legacy contours should be retired, but in their experience, consumers will expect and demand a replacement product.

NCEM is still intends to produce contours, complicated by concerns about resolution and methods to support a surveyor-sealable product. Other elevation data processing is taking priority. Mr. Badr cautioned against publishing 1-foot contours that are not suitable for engineering and design purposes; contour intervals of 2 feet are appropriate for planning

purposes. Mr. Brown added that NOAA's Coastal Data Viewer has a function that generates contours from NC LiDAR data in a user's location of interest. The output is not smoothed into a cartographic product that some users prefer for planning purposes, but it is an option until North Carolina generates contour data for public access. Also, there are self-service options for users with various desktop software tools to apply to DEM.

- *HYDROGRAPHY*

Cam McNutt of the NC Department of Environmental Quality (DEQ) opted to report on hydrography plans later in the meeting as part of his working group report.

- *GEODETIC CONTROL*

Hope Morgan reported on behalf of Gary Thompson who could not attend today. She gave an update on the 2022 Reference Frame under this item. Of concern to the 2022 Reference Frame Working Group is the redefinition of State Plane Coordinates which will have an impact on GIS in general, and property mapping in particular. Cadastral mapping uses digits from State Plane Coordinates to construct unique parcel identification numbers. Tiling schemes will change. The fixed plate solution is an advantage. The goal is to make the offset consistent across the state. The Working Group is developing specifications, plans, impacts, issue papers, and recommendations for adjusting to the new reference frame. Outreach will be vital.

In terms of briefing the GICC, Ms. Morgan advised letting the 2022 Working Group meet a couple more times to work out details before Gary Thompson reports to the Council.

- *GOVERNMENTAL UNITS*

Regarding county boundaries, Hope Morgan reported that work is underway on the NC-VA boundary, including history of the boundaries, as the states collaborate.

For NC county boundary projects, plats will be recorded in August for the Chatham-Harnett-Wake corner and for Alamance-Guilford. Six reports were submitted to counties, and six projects are in progress.

Regarding municipal boundaries, Sarah Wray reported on behalf of John Farley, who was not available today, that new information will be shared by the Working Group on Municipal Boundaries later in the meeting.

- *TRANSPORTATION*

Sarah Wray reported ongoing maintenance and quarterly publication of road characteristics and routes data and map services. The next data update is scheduled for August 13. The roads and highways implementation is stable and editing has caught up with projects.

Discussion led by Mr. Badr pointed out that transportation in North Carolina is multi-modal. Ms. Wray suggested an NCDOT report next time that includes information on geospatial data from the Rail Division, the Aviation Division, and bicycle/pedestrian efforts. Multi-modal data is important, for example, in work on rail crossings and traffic

safety. She suggested that she request status and interest among transportation groups within NCDOT. For example, the Aviation Division now has contractors with GIS and aviation experience who can share information. Ms. Wilson confirmed local government interest in trails, greenways and bicycle paths.

- *ADDRESSES*

David Giordano (CGIA) reported that the *AddressNC* project manager position has not been filled yet. The plan had been to update the statewide dataset for address points and use it for many purposes including the Next Generation of 911 communications (NextGen911). A new path has emerged for state acquisition of address data from local governments. The NextGen911 requirement for address data and the hiring of a contractor for geospatial data acquisition by the NC 911 Board, expected by September, means that *AddressNC* should not continue to follow its own data acquisition path, but collaborate with the contractor on data acquisition for NextGen911. Mr. Johnson continued by explaining that other datasets required by NextGen911 will include road centerlines, administrative boundaries, fire districts, public safety boundaries, emergency medical service boundaries, and PSAP boundaries. In a coordinated approach, *AddressNC* can focus on geospatial services based on address points delivered by a contactor. NextGen911, including a network and statewide data, is planned to be deployed by the end of 2020. Mr. Badr pointed out the 2022 Reference Frame should be considered by the contractor in plans to maintain the data.

Working Groups

Working groups reported on activity in the last quarter.

WORKING GROUP FOR ROADS AND TRANSPORTATION

Sarah Wray reported that SMAC approved the revised standard for road centerlines on April 18, the GICC received the revised standard for a 30-day review period starting June 26, and SMAC will recommend GICC adoption at the Council meeting on August 8. Mr. Johnson recommended that Mr. Badr, in his SMAC report to the Council, recognize Nik Zisk (NCDOT) of the Working Group to briefly summarize the changes in the standard and field any questions. Then Mr. Badr will recommend GICC adoption.

METADATA COMMITTEE

Sarah Wray, chair of the Metadata Committee, reported on activity including assistance from NC Central University. She announced two metadata training sessions to be hosted by Dr. Tim Mulrooney in a lab at the university on August 2 and October 16. A flyer was shared and will be sent to SMAC members and the Local Government Committee. In addition, the committee is updating the guide document on creating and editing metadata. Lucy Brady (NCDOT) is editing the step-by-step guide to accompany training sessions for local government GIS practitioners. The guide is expected to be completed in about a month. The goal is to contact local governments and user groups that have offered to host training and get sessions scheduled. Ms. Wray will request comments from the full Metadata Committee and SMAC members.

Also, Hope Morgan will send the USGS metadata parser used for LiDAR metadata to Ms. Wray to compare to the online USGS metadata parser for the Content Standard for Digital Geospatial Metadata.

The next big topic for the committee is validation of ISO 19115-1 metadata. Based on the approved and federally adopted XML schema (ISO 19115-3), open source metadata validation tools are being rolled out this summer. Cam McNutt added that the Department of Environmental Quality (NCDEQ) created a training document for using the State and Local Government Metadata Profile (ISO-based) with ArcGIS Online (AGOL) metadata. That predated the new release of AGOL that allows layer-level metadata (formerly, services with multiple layers had only one metadata record for the combination). He will look into an update of the NCDEQ metadata template and training document if needed.

Six YouTube videos hosted by NC Central University provide online metadata instruction. It would be useful to know about the level of use of the videos to date.

In reflecting on the work of the Metadata Committee, Ms. Wray explained that progress has been slow in the last year. While many of the training goals and curriculum development tasks were met, a graduate student did not meet expectations due to unfortunate circumstances, and the committee has not met metadata implementation goals. Work remains to solve metadata deficits, especially in local government GIS operations. She is optimistic about implementation now that NCDOT has an internal resource to assist in the effort and more training is coming up.

HYDROGRAPHY WORKING GROUP

Cam McNutt (NCDEQ) reported that the working group scheduled seven meetings for this summer. The group identified topics, the first of which is the NCDOT project called Advanced Transportation through Linkages, Automation and Screening (ATLAS). SMAC has recognized that hydrography data is a priority for improvement. The working group heard a presentation by consultants who are working on a Walnut Creek pilot project. They explained an approach that integrates the Headwater Streams Spatial Dataset (HSSD) developed by NCDEQ with the National Hydrography Dataset (NHD) and described the level of effort and costs for optional methods and products.

The extensive analysis led to a recommendation that the ATLAS project consultants update the geometry of hydrography first and defer integration in the NHD model. The plan for the geometry is to combine HSSD with streams delineated in stream studies by the Floodplain Mapping Program in the low lying, flat areas where HSSD models are not sufficient. The product would be the NC ATLAS Hydrography Dataset beginning in NCDOT priority areas. The data could evolve into NHD for more functionality and attribution, but the practical approach is to expend available resources first on a better geographic representation of streams. Also, Hope Morgan noted that the Floodplain Mapping Program provides its stream-related flood hazard data to the Federal Emergency Management Agency for its national flood hazard dataset.

Next week, all SMAC members are welcome to a meeting of the Hydrography Working Group by conference call (July 25) that will include a summary of the analysis of alternatives and the results for the pilot area. The Division of Water Resources will present the status of the HSSD in a working group meeting on August 9. Meanwhile, Mr. McNutt will be consulting the USGS NHD steward program and plans to make hydrography stewardship the topic of an August 22 meeting of the working group. The group will meet in person on September 13 to review and synthesize the findings of the previous meetings, clarify relationships with NHD and NC ATLAS Hydrography Dataset, and set agendas for monthly calls in the fall. Mr. McNutt and ATLAS consultant Zsolt Nagy agreed that the emphasis is more accurate mapping to support business needs that have been identified in the state since work began on improved stream mapping in 2004. The data will go into a screening tool created for the ATLAS project related to prioritization of transportation projects, one of the primary business needs in state government. Mr. McNutt offered a briefing on the ATLAS project at an upcoming SMAC meeting.

The draft charter for the Hydrography Working Group was distributed to SMAC for review on July 3. Mr. McNutt explained that the charter is intended for improvement in generic hydrography data in North Carolina, not limited to a specific data model, while the charter also includes work on a potential NHD stewardship agreement. This is an opportunity to rename the "Stream Mapping Advisory Committee" to the "Hydrography Working Group" to be more consistent with names of other working groups and to avoid confusion about acronyms (e.g., SMAC and StreamMAC). The charter includes a list of suggested organizations for representation. Mr. McNutt acknowledged that he lacks a current contact on the topic of streams from the US Army Corps of Engineers, but he will continue to seek someone from the Corps to participate in the working group.

> Voted: SMAC approved the Charter for the Hydrography Working Group, presented in draft form, as final.

Mr. Johnson added that since the last SMAC meeting, the GICC submitted a letter to the Environmental Management Commission as a public comment concerning the GICC role in water quality rules. SMAC discussed the issue in April and reviewed the letter in May. Approval by the Management & Operations Committee led to submission by the July 2 deadline. Mr. McNutt will keep SMAC updated on the status of the comments and rules.

ORTHOIMAGERY AND ELEVATION

Hope Morgan reported the working group met July 16. In addition to regular updates by the NC Orthoimagery Program and NCEM on elevation data, the group discussed the status of National Agriculture Imagery Program (NAIP) imagery acquisition and product distribution. The current understanding is that NAIP will be acquired this summer over North Carolina as 4-band leaf-on imagery, and access to the imagery will continue to be free of charge under an apparent status quo approach by the US Department of Agriculture. On the topic of statewide orthoimagery and the 4th band, no local government in the 2018 region has ordered a color infrared product from a contractor.

On the topic of imagery for emergency response and recovery, Mike Aslaksen of NOAA explained to the working group the availability of "before" coastal oblique imagery captured this year as a baseline and the process for acquiring and publishing oblique imagery after a storm event. The ground resolution is 15 to 35 centimeters, or about 3-inch to 6-inch pixels. The quick turnaround in recent years has been impressive. NCEM coordinates with NOAA and other federal agencies during a storm event to avoid duplication of imagery acquisition and capture the critical locations. Also, NCEM is collecting and testing oblique imagery using an Unmanned Aircraft System over selected dams as part of a grant project with the US Department of Homeland Security.

On the topic of unmanned aircraft systems, NCEM is developing its database for qualified and pre-approved local government UAS operators who could be activated in an emergency.

NC BOARD ON GEOGRAPHIC NAMES

Tim Johnson, interim chair, presented nine naming recommendations. Six stream names for previously unnamed tributaries were approved by the NC Board on Geographic Names (all in the City of Winston-Salem in Forsyth County): Jincy Creek, Bethel Branch, Carrie Creek, Kimel Branch, Sandy Branch, and Sophie Creek. The Board decided it had "no opinion" on three proposed names: Griffith Mill Pond (Forsyth County), Tilley Mill Pond (Surry County), and Wren Creek (Mecklenburg County). After discussion, Mr. McGuire moved to approve submission of the state recommendations to the US Board on Geographic Names, seconded by Ms. Morgan.

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

WORKING GROUP FOR LAND COVER

Jeff Brown reported on behalf of Kenneth Taylor, chair, who had a conflict today. The report from the Working Group for Land Cover, distributed to SMAC on July 3, documents significant business needs for land cover data.

In brief, most business needs 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.

The priority requirements for land cover data identified by the working group based on a survey of stakeholders:

- Ground resolution of 1-meter or better in a raster product
- Reliable distinction between what is classified as impervious surface, tree cover, farm fields, and wet areas at a minimum
- Frequency of at least annual classification to detect land cover change

The Working Group's survey found a difference in requirements between local government applications—benefitting from the highest resolution—and applications by state, university and federal agencies where resolution requirements are more varied.

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.

As listed in the report's Next Steps section, the Working Group seeks feedback 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?

The "Next Steps" section of the Report provides a roadmap for refining and strengthening the business needs with a suggested series of interviews with all parties to focus the Working Group's survey findings and learn more about how land cover products are created in local governments as well as in federal agencies and universities. Kenneth Taylor would like to request SMAC comments about next steps toward defining one or more products, determining methods, estimating costs, and defining a business case for one or more products.

A brief discussion touched on the context of available federal and university data and techniques, new technology for imagery sources and classification tools, and the importance of defining a business case for meeting the most beneficial state and local government business needs. To give SMAC members more time to review the report and consider next steps, Mr. Badr suggested an email to SMAC members with a request for comments in preparation for more discussion at the next SMAC meeting.

WORKING GROUP FOR MUNICIPAL BOUNDARIES

Bob Coats, serving as co-chair with John Bridgers, as appointed by SMAC Chair Paul Badr, reported that the group held its initial meeting on June 26 and agreed on a draft charter, distributed to SMAC for review on July 3. Mr. Coats explained many stakeholders need a statewide geospatial representation of current municipal boundaries and associated information, including the State Demographer for municipal population estimates, NC Department of Transportation and the Powell Bill program, the Department of the Secretary of State for statewide coordination of the Boundary and Annexation Survey (BAS), and the Census Bureau for the best available Census geography. The process of sharing information on boundary changes has been analyzed in recent years by NCDOT and the Land Records Management Program, but the group is taking an in-depth look at incentives and ways to make data sharing by the local government sources comprehensive and efficient for local and state governments and for geospatial data consumers. Also, the Census Bureau will send a letter about the BAS process to local governments in August to promote consolidation of BAS at the county level for reporting municipal boundary changes for constituent municipalities. Mr. Coats consulted with Mr. Bridgers, Rich Elkins and Michael Cline to offer a paragraph about North Carolina needs for the BAS letter. Mr. Coats explained the vision of a statewide dataset of municipal boundaries that could be considered official, serve the business

needs identified, and have the potential to meet needs of the Census Bureau for a single statewide BAS submission someday. The working group meets next on July 26 to clarify needs, opportunities, and common denominators. The group plans on developing recommendations to SMAC by September, understanding the need for timeliness if one or more legislative changes are recommended. There may be process solutions and/or incentives that do not require a change in a statute, avoiding the risk of a legislative process affecting the maintenance of a municipal boundaries dataset in an unintended way.

Mr. Coats noted that the charter lists organizations to include, but he invited any interested people to participate in the working group.

> Voted: SMAC approved the Charter for the Working Group on Municipal Boundaries, presented in draft form, as final.

Mr. Badr thanked Mr. Coats and Mr. Bridgers for taking on the assignment to lead the working group and making good progress.

Regular Status Updates

NATIONAL GEOSPATIAL PROGRAMS OFFICE

Silvia Terziotti was not available to report today. During the discussion of the work of the Hydrography Working Group, Mr. McNutt, Ms. Morgan, and Mr. Giordano confirmed that they filled out the USGS survey on elevation data for their respective organizations.

NC ONEMAP

No report today in the interest of time.

Work Plan Update

Mr. Brown explained that the SMAC Work Plan is updated each fiscal year, typically in July and August. He noted that some of the tasks in the Work Plan for Fiscal Year 2017-2018 have been completed, and some are ongoing in nature. Also, the GICC developed Elements to Guide the Direction of the Council, including tasking of standing committees. Mr. Badr requested that CGIA annotate and send out a copy of the SMAC Work Plan to SMAC members for comment, and prepare to finalize and approve in the October SMAC meeting.

In-Meeting Task Review

(1) Mr. Badr will note in his report to the GICC the SMAC discussion of the importance of local government data sharing in support of statewide data and business needs.
(2) SMAC will recommend GICC adoption of the revised data content standard for road centerlines at the Council meeting on August 8.

Adjourn --The meeting adjourned at 3:40 PM.

2018 SMAC Meeting Dates

Wednesday, October 17, 1:30 PM, location to be determined.