

# Statewide Mapping Advisory Committee Meeting

## Minutes

Wednesday, January 23, 2019; 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 Sarah Wray, Rich Elkins, John Bridgers, Cam McNutt, Gary Thompson, Kenneth Taylor, Sean McGuire, Bob Coats, Tim Johnson, Ben Shelton, David Giordano, Jeff Brown, and on the phone Alice Wilson, Hope Morgan, Jeff Essic, Camille Tyndall Watson, Steve Averett, and Stephen Dew. Zsolt Nagy attended as a visitor and Scott Davis called in as a guest presenter.

## Minutes

The committee approved the October 17, 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 2018 Northern Piedmont and Mountains project delivered orthoimagery products to 26 counties, including 30 Public Safety Answering Points (PSAPs) in the first week of December.
- Imagery services for 2018 were published the first week of December, including the “imagery-latest” service.
- True orthoimagery was successfully produced for tall buildings in Greensboro and Winston-Salem downtown areas. The imagery removed all building lean from structures over 40 feet tall.
- Based on comments from the Working Group for Orthoimagery and Elevation, the project team lightened shadows in the urban areas to ensure transparency to better display ground features such as sidewalks.
- The 2019 project is in progress, with contracts in place for four imagery acquisition vendors: Surdex Corporation, Atlas Geographic Data, Spatial Data Consultants, and Sanborn Map Company. The project area covers 21 counties. Half of the tiles are considered mountain tiles.
- True orthoimagery will be produced for tall buildings in Asheville and Charlotte in 2019.
- Flights for imagery acquisition are expected to get underway during the first or second week of February and continue into April in the mountains.
- The Orthoimagery Program website is up to date and provides another path to download imagery mosaics.

- *CADASTRAL*

John Bridgers (Working Group for Seamless Parcels) reported that 98 counties updated their parcels in the NC Parcels Transformer during 2018. The two remaining counties have either source data update issues or a personnel change and a lack of understanding of the value of participating. Mr. Bridgers has asked to be on the program of the county commissioners conference in the spring to promote NC Parcels. Mr. Badr and Mr. Johnson suggested face-to-face outreach via visits or meeting at the NC GIS Conference to explain the value and persuade the counties. Mr. McNutt added that the General Assembly requests research by the Department of Environmental Quality that involves parcel data and money. Counties not participating may be missing out on state funding. Mr. Badr and Mr. Bridgers emphasized the value of statewide parcel data in disaster response, echoed by Alice Wilson who received calls from FEMA about property information. Mr. Bridgers points out that 10-15 minutes of training by consulting the user guide and 10-15 minutes twice a year to run the Transformer are reasonable requests that many of the counties do reliably, but many share data but don't take on running the online tool. Mr. Brown pointed out that some counties have set up a quarterly routine to run the updates, and he is tracking county progress on a four-season basis now. The working group will consider the best ways to reach out to counties that need encouragement. Revaluation can delay parcel updates in a few counties each year as revaluations occur on a rotating basis at least every 8 years for a given county, with variations in recurrence by county.

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.

- *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. A final report is pending and reports from Geodetic Survey will be posted online.

Phase 5 is in progress, with quality control completed for 18 of 21 counties. A complication is the federal government shutdown that has delayed review of completed counties by funding partner USGS. Ms. Morgan needs to confirm with USGS, when back in operation, that NCEM may release Phase 5 data sooner with the understanding that issues found by USGS review will be fixed. Based on minimal issues found in Phase 4, she expects minimal issues in Phase 5 that can be solved readily.

Ms. Morgan confirmed that digital elevation models will be available for the NC Imagery Program for 2019 imagery, and NCDOT has copies of bare earth data in the Photogrammetry unit.

- *HYDROGRAPHY*

Cam McNutt of the NC Department of Environmental Quality (DEQ), as requested at the last SMAC meeting, invited Scott Davis of Axiom, a contractor to NCDOT, to report on hydrography developed by NCDOT's Advancing Transportation through Linkages Automation and Screening (ATLAS) project. ATLAS is producing geospatial datasets to enhance NCDOT project planning.

Scott Davis reported that contractors completed statewide hydrography data as a first-phase representation of surface waters as a planning tool to meet the immediate needs of the ATLAS project. The effort combined the stream network from the Division of Water Resources, the Headwater Streams Spatial Dataset (HSSD) produced in the Division, and data that simulate streams from the Floodplain Mapping Program in the low-lying, flat areas where HSSD models are insufficient. Where available, the team used open waters identified from LiDAR data. The stream product will serve the ATLAS program this year for purposes of protecting surface water. The future envisioned by the Working Group will add more attribution and stream events, followed by integration with the National Hydrography Dataset (NHD).

Starting with a pilot project in a 10-digit hydrologic unit in the Neuse River Basin, the project team combined datasets. The team found that editing existing stream data to integrate HSSD streams into the dataset and integrating into NHD consumed far more labor and time than was available for producing statewide streams for the ATLAS project in 2018. The team created a path for stream data that can be extended to full integration with NHD. The process included data selection and cleanup to develop a complete stream network. 10-digit hydrologic units were combined into larger 8-digit units. Attribution of stream lines, based on data from the Division of Water Resources, is nearly complete. Mr. Davis observed that ongoing maintenance of the data using the same processes would be practical.

In discussion, Mr. Davis explained that the team used double-line streams where available from data sources. HSSD contains only single-line streams. Hydro-flattened bodies of water from LiDAR can be represented by polygons that are integrated in the process. Hope Morgan explained that LiDAR contractors supply hydro-flattened polygons as required by USGS specifications—100 and more feet across and ponds of 2 acres or larger, not for every water body. Quality control of LiDAR included use of water body polygons supplied by USGS.

The end products represent surface water in two dimensions. Mr. Badr described a method to produce a three-dimensional product using an elevation gradient. He added that elevation and orthoimagery are base layers for display and quality control of the stream data. Ms. Wilson pointed out the value to local governments where an improved hydrography dataset can be used with building footprints in flood hazard analysis.

Mr. Badr requested a visual display of the new dataset at the next SMAC meeting.

Mr. McNutt added that the Hydrography Working Group plans to propose a way to host the data in the Department of Environmental Quality and make it available to the public. A challenge will be to tie the stream network into stormwater infrastructure for a more complete representation of a network.

- *GEODETIC CONTROL*

Gary Thompson reported the 2022 Reference Frame will be dependent on models, including gravity models. NC Geodetic Survey will collect gravity data in the mountains this spring support of the National Geodetic Survey. Gravity is included in the new 2022 geoid model for getting elevation from Global Navigation Satellite System (GNSS) data. Applications include real time construction machine control in grading. The datum change in North Carolina will amount to about 2 meters horizontally. Vertically, the change will be approximately 1 foot. More on the 2022 Reference Frame is included in the working group report below.

- *GOVERNMENTAL UNITS*

Regarding county boundaries, Gary Thompson reported that plats were recorded for the Chatham-Harnett-Wake corner, Alamance-Guilford, and Harnett-Wake, and plats are expected next month for Harnett-Chatham. Reports were submitted by NC Geodetic Survey to Hoke-Robeson, Cabarrus-Rowan, and Union-Mecklenburg. Nine projects are in progress for Davie-Yadkin, Mitchell-Yancey, Jackson-Macon, Bladen-Columbus-Brunswick, McDowell-Mitchell, Granville-Franklin, Polk-Rutherford, Chowan-Perquimans, and Harnett-Johnston. New LiDAR data will inform establishment of ridge lines that serve as county boundaries.

Regarding municipal boundaries, Sarah Wray, reporting for John Farley, deferred to the Municipal Boundaries Working Group (report below).

- *TRANSPORTATION*

Sarah Wray reported for John Farley. The first quarter publication date is February 11, including rail crossing and rail lines. Powell Bill municipal boundaries will also be published as an annual update. NCDOT's GIS Unit is working with the Aviation Division to expand its use of GIS related to data collected by unmanned aircraft systems. The bicycle/pedestrian group as been working within the ATLAS project. The GIS Unit is looking at their data as well. Ms. Wray plans to report more multi-modal information as well as highway information. On the topic of road signs, data are in two sections. The Asset Management team manages data on signs with the exception of overhead signs that are classified as structures and managed with bridge data. Structure information is published quarterly.

- *ADDRESSES*

David Giordano (CGIA) had no new information to report.

## Working Groups

Working groups reported on activity in the last quarter.

### *METADATA COMMITTEE*

Sarah Wray, chair of the Metadata Committee, reported that a new workbook on editing metadata using ArcGIS software is being refined and will be tested by Stephen Dew and Guilford County. Lucy Grady will do a presentation on the workbook at the NC GIS Conference. Dr. Timothy Mulrooney will also do a conference presentation on metadata.

### *HYDROGRAPHY WORKING GROUP*

Cam McNutt (NCDEQ) reported that the working group will meet next month to look at the new data from the ATLAS project.

### *ORTHOIMAGERY AND ELEVATION*

Gary Thompson reported the working group met January 17 and received updates from the Statewide Orthoimagery Program and the National Agriculture Imagery Program (NAIP). Mr. Thompson described the State Emergency Response Application and the acquisition of oblique imagery over high-hazard dams in Gaston, Cabarrus, and Union County under a grant from the Department of Homeland Security. First responders can access the imagery on mobile devices.

On the topic of contours, Hope Morgan explained that quality control needs to be completed on Phase 5 before work can begin on contours. For contours, she plans to create 1-foot contours by county using the highest resolution digital elevation model available across the state. She is testing smoothing factors, but she prefers not adding error to make the product look smoother. Contours will replace the legacy contours created by NCDOT years ago and still available to the public.

After the federal government shutdown ends, Ms. Morgan plans to consult with project partner USGS about using data from Phase 5 before final sign-off by USGS, with the assurance that any fixes identified by USGS will be incorporated in the data and delivered to USGS. She explained that NCDOT has copies of the Phase 5 data that are intended to support 2019 orthoimagery processing and NCDOT planning, but she needs to hold off on publication until an understanding with USGS is reached.

Ms. Wilson pointed out that GIS software is capable of generating contours from digital elevation models (DEMs) downloaded from NCEM, with smoothing options. She generated contours in response to Hurricane Florence to visualize elevation with building footprints. She is supporting planning with analysis and maps related to flood damage and hazard mitigation. Mr. Johnson pointed out that generation of contours from LiDAR-derived data is one of the use cases reviewed by the Working Group for PLS and GIS. Ms. Wilson added that she uses DEMs in modeling to represent areas that might flood, for planning purposes.

### *NC BOARD ON GEOGRAPHIC NAMES*

Tim Johnson, interim chair, reported that on December 13, the US Board on Geographic Names approved all four names that were presented at the last SMAC meeting, including Tilleys Mill Pond despite the state board's disapproval. The NC Board on Geographic Names has not receive any cases to review since October.

#### *2022 REFERENCE FRAME WORKING GROUP*

Gary Thompson, chair, reported that all state plane coordinate systems in the nation will be redefined and referenced to the 2022 Reference Frame. Requirements from the National Geodetic Survey (NGS) include making the plane as close to topographic features as possible to minimize the difference between grid and ground. North Carolina's mountains create a challenge and potential distortion. Discussions with NGS involve potential exceptions related to changing state plane coordinates as little as possible and the option of changing state plane coordinates by a large amount. He pointed out 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. He noted that the millions value does not affect PIN numbering. However, changing coordinates by 1 million will result in some negative values which are not acceptable. Going to 3 million would create more distortion. Also, naming tiles for orthoimagery and LiDAR will be affected.

From a project management perspective, the state would have some time to make changes and move from NAD 1983 (2011). The plates will be fixed by NGS on January 1, 2022 and North Carolina will need to have decided what to do. Transition may take longer for some local governments. GIS software is expected to translate and enable gradual transition. For example, Esri is working with NOAA and NGS on models and tools. Mr. Thompson expects dual real time systems for some period of time to accommodate users of old and new datums.

Mr. Thompson will continue communicating with NGS and the working group will develop proposals to the National Geodetic Survey to mitigate impacts. In response to a question from Ms. Wilson, Mr. Thompson offered to work with local governments to write a paper on how 2022 Reference Frame will affect local government GIS. He has a template to share as a starting point. Also, data published by federal agencies will include metadata to inform transformation to a preferred projection for local government GIS.

#### *WORKING GROUP FOR LAND COVER*

Kenneth Taylor, chair, reported that he will submit a poster on business needs for land cover to the NC GIS Conference. He will accompany the poster with a handout of the survey conducted last year to enlarge the sample of respondents to confirm or refute apparent 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. If he can confirm that there are two groups of business needs, different products may be required to meet the groups of needs. He expressed appreciation for the working group and staff in efforts to refine the report.

#### *WORKING GROUP FOR MUNICIPAL BOUNDARIES*

Bob Coats, serving as co-chair with John Bridgers, reported a delay in distributing Census materials for the Boundary and Annexation Survey (BAS) and the Participant Statistical Areas Program because of the federal government shutdown, but they will be going out and deadlines for submissions remain the same. Mr. Coats and Michael Cline, State Demographer, are conducting regional workshops this month in support of the Census programs.

The Municipal Boundaries Working Group met January 8 and got feedback from some counties in a pilot group to test a data flow of annexation information from counties on behalf of municipalities. Some counties had little or no annexation activity late in 2018. Mr. Bridgers is inviting more counties to participate in the test.

Mr. Thompson and NC Geodetic Survey proposed technical assistance to improve the source plats to better meet geospatial needs. For a statewide dataset, the Working Group is beginning to look at recommending a standard schema for municipal boundaries. Regarding a baseline set of statewide municipal boundaries, a subset of the Working Group will compare available geospatial representations of municipal boundaries (Powell Bill boundaries, Census places, local government data, and Boundary Quality and Reconciliation Process files from the Secretary of State) to assess the level of effort to produce a better-quality statewide dataset. From the best available baseline, maintenance could be achieved with timely digital representations of annexations.

The Working Group discussed business needs for extraterritorial jurisdictions (ETJ) and how those boundaries are produced and maintained by local governments in separate processes. The group decided that ETJ data management would be valuable, but it is beyond the current scope of the working group and appears worthy of a separate effort.

#### **Regular Status Updates**

##### *NATIONAL GEOSPATIAL PROGRAMS OFFICE*

No report (Silvia Terziotti was not available as a result of the federal government shutdown).

##### *NC ONEMAP*

David Giordano reported that 2018 is available as imagery services and through the download tool for tiles of orthoimagery. He demonstrated the download of one tile at a time for a selected year (image file and world file). Mr. Badr observed that communicating the availability of multiple years is important. Mr. Shelton added that the website for NC Orthoimagery provides another path to imagery download.

#### **Work Plan Update**

The SMAC Work Plan includes research and reporting on data access policies and practices of private utilities. Hope Morgan is leading the effort. This is parallel to research into local government utility policies and practices as well as Council research on legal aspects. She had the opportunity to talk to an energy emergency working group. They discussed data sharing and

policies pertaining to emergency situations and everyday needs. She has a list of people to contact for more information. She has a list of communication vendors as well. She plans to compare notes with the Local Government Committee to avoid overlap. She explained that actual locations of fuel pipelines are definitely restricted from public access. Jeff Brown will help coordinate between the SMAC effort and the Local Government Committee. Mr. Johnson emphasized that this topic is a priority of the Council and encouraged progress in this discovery stage. Mr. Taylor confirmed the expected value of greater understanding of what can be shared for public and private purposes.

This infrastructure data access effort will be highlighted at the next SMAC meeting.

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

**2019 SMAC Meeting Dates**

Wednesdays, April 17, July 17, and October 16

Time: 1:30 PM

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