North Carolina
Geographic Information Coordinating Council

Minutes
August 13, 2015

PRESENT
Chair: Stan Duncan. Members: Bob Brinson (co-chair), Allan Axon, David Baker, Jay Bissett, Marc Burris, John Cox, John Dorman, Ryan Draughn, Dianne Enright, John Farley, John Gillis, Derek Graham, Tim Mulrooney (for Joanne Halls), Matthew Helms, Bliss Kite, Sarah Koonts, Dan Madding, Elaine Marshall, Twyla McDermott, Linda Millsaps, Doug Newcomb, Josh Norwood, Kevin Parrish, Anne Payne, Alex Rankin, Allan Sandoval, Richard Taylor, Ron York
Staff: Tim Johnson, CGIA

ABSENT
Jon Beck, Kathryn Clifton, Kristen Culler, Chloe Gossage, Josh Norwood, Hunter Robinson, Sharon Rosado, and Joseph Sloop

PROCEEDINGS

A meeting of the Geographic Information Coordinating Council was held in the Board Room of the Department of Public Instruction in Raleigh, North Carolina. Chair Stan Duncan called the meeting to order.

Chair Announcements

Mr. Duncan welcomed new Council member Dr. Linda Millsaps, representing the NC Association of County Commissioners. She is the new Research Director for the Association. Her experience includes operations in the Department of Revenue, county tax administration, and fiscal analysis for the General Assembly.

Doug Newcomb has been appointed by the Governor and approved by the US Fish & Wildlife Service to serve as the federal representative on the Council.

Allan Axon is now the designated representative for the Secretary of Environment and Natural Resource, replacing designee Keith Werner who has moved to the Office of Information Technology Services.

Also, Mr. Duncan welcomed Dr. Tim Mulrooney from NC Central University, filling in today for Dr. Joanne Halls.

Approval of Minutes

The minutes of the May 13, 2015 meeting were approved with no changes.

Committee Reports

Statewide Mapping Advisory Committee (SMAC). Ryan Draughn, SMAC chair, reported that the SMAC met on July 13. The committee focuses on framework datasets and related opportunities, development, maintenance, and standards. Priorities include implementation of the new metadata standard with a goal of expanding and improving metadata in state and local government. The Metadata Committee is entering the implementation phase with Sarah Wray, NCDOT, serving as chair and strong interest and willingness to serve by many. The committee has a draft plan and will meet August 20 to refine the plan and get started on a phased approach. The second priority is overall maintenance of statewide parcels and identifying ongoing funding for operation and maintenance of the online parcel transformer.

Mr. Draughn called on Jeff Brown for an update by the Working Group on Seamless Parcels. He reviewed progress of the NC Parcels Project since the last Council meeting, showing maps of completion by county. All counties were transformed to include the standard fields by the end of June. The project team reached a milestone last week when all of the original 25 counties were updated with 2015 data. In terms of data quality, statewide parcel data are complete (100 percent participation by the authoritative county sources), current (all 2015), well documented with metadata, and accessible via NC OneMap as web services and downloadable files. Some counties did not publish values for some of the standard fields, requiring more outreach in future updates. For this collaborative project, Mr. Brown acknowledged the Management &Operations and Statewide Mapping Advisory committees for oversight of the project, the Local Government Committee for advocacy; US Environmental Protection Agency for the grant to build the Parcel Transformer; support from project partners including cost share from NC Department of Transportation and NC Department of Agriculture & Consumer services; Pam Carver, John Bridgers and Tom Morgan of the Working Group for Seamless Parcels for ongoing technical assistance to counties; and the Carbon Project, Inc. for hosting and maintaining the online Transformer. CGIA continues to manage the project and provide technical assistance. Next steps include minor technical improvements, updates in NC OneMap, parcel updates during September through November, promotion of do-it-yourself transformation by counties, review of consistency and completeness, full automation of NC OneMap updates, refinement of a budget and business case for a funding solution, and a procurement process for maintaining the online application after the contract with the Carbon Project expires in May 2016. (See Parcels_GICC PPT file at GICC website - http://www.ncgicc.org/GICCMeetings.aspx).

Dan Madding requested statistics on use of the parcel web services on NC OneMap; David Giordano confirmed that statewide parcels is the most popular non-imagery web service.

Mr. Duncan asked how North Carolina stands nationally with respect to standardized, accessible parcel data. Mr. Brown reported that Nancy von Meyer, national parcel data expert, places North Carolina in the top five states along with Arkansas, Florida, Montana, and Utah. Among the leading states and those with notable progress, she pointed out that North Carolina has a relatively large set of standard fields, is truly statewide, and is current. She congratulates North Carolina and notes that the

state has a long history of national prominence in land records management. Mr. Duncan expressed pleasure and appreciation for completion of this foundational dataset and suggested a longer presentation in November. He expects many applications of parcel data in the state and nationally.

Mr. Draughn commented that North Carolina is also a leading state in metadata. Also, geodetic issues are tied for second among SMAC priorities. He called on Gary Thompson to report on behalf of a new 2022 Reference Frame Working Group. Mr. Thompson explained that the National Geodetic Survey plans to revise geodetic reference frames in 2022 with a major impact on all GIS work. The new Working Group is forming to develop recommendations to the National Geodetic Survey. Solutions for GIS practitioners relate to a fixed plate for state plane coordinates to avoid impacts of proposed dynamic reference frames. South Carolina is interested in coordinating recommendations. Mr. Thompson will submit a draft charter and a list of group members to Tim Johnson and Mr. Draughn and organize a first meeting.

Mr. Duncan inquired about the status of legislation related to the NC-SC boundary. Mr. Thompson will have more information after a meeting with attorneys working on language related to title searches. Legislation is in the Finance Committee and may receive action this session. A public meeting in South Carolina is upcoming as well on August 26. Mr. Duncan observed that Greenville County, SC and Henderson County are coordinating parcel boundaries with reference to the reestablished state boundary.

On the topic of address standards, Mr. Draughn responded to a question from Anne Payne during the May Council meeting. He consulted Joe Sewash, CGIA, and learned that the National Emergency Numbering Association (NENA) plans to release a new standard this month, the "US Civic Location Data Exchange Format." SMAC plans to review that standard with respect to addressing in NC.

Local Government Committee (LGC). Kevin Parrish (for Kathryn Clifton, LGC chair) reported that LGC continues to promote the value of statewide datasets and plans to work on an e-book on the "Value of GIS" in local and state governments as one of its priorities for 2015-2016. The committee sees even more potential for integration of GIS throughout local government operations, and an e-book can help explain the value. As a second priority, LGC plans to support metadata in local government by promoting the new State and Local Government Metadata Profile templates and participating in training efforts. Committee members continue to be advocates within their professional organizations for statewide parcels, improvement in Census boundaries, data standards and practices, and mobile technologies. LGC meets on August 19 to discuss these priorities and update the committee's work plan. Mr. Duncan emphasized that metadata outreach, training, and use will be important to local governments.

State Government GIS Users Committee (SGUC). John Farley, SGUC Chair, reported that a new Enterprise License Agreement (ELA) between the State and Esri is still in progress with work remaining on the master purchase agreement. The previous ELA was extended from July through October. Each state agency that uses GIS software signed a memorandum of agreement with the Office of Information Technology Services (the party to the agreement with Esri). In response to a question from Mr. Duncan, Mr. Farley explained that agency cost-share in the previous five-year agreement was based the proportion of licenses by agency, recalculated each year. The new agreement has higher total cost, but proportional cost per agency will be fixed for the three-year period of the agreement for more predictable budgeting. State agencies are looking at software to

manage GIS licenses efficiently and are considering open source software solutions for some business needs.

Regarding collaboration, NCDOT GIS is working with Tom Morgan, Department of the Secretary of State, to update, improve, and integrate the state collection of municipal boundaries. They are also looking at state mandates and requirements that collect local government data and ways to combine data collection efforts to save time and money. The SGUC Executive Committee meets tomorrow and the next general meeting is August 27. Secretary Marshall thanked Council members in advance for the anticipated cooperation by municipalities in providing annexation data. Mr. Draughn confirmed that Tom Morgan has reached out to the NC League of Municipalities, and Mr. Duncan observed that Mr. Morgan obtained copies of municipal boundaries from almost all if not all the jurisdictions.

Regarding data development, NCDOT's statewide street centerlines project is reviewing a delivery of all roads and expects a final dataset around the end of September, to be followed by catching up on a backlog of changes that have been on hold until data completion.

***Federal Interagency Committee (FIC*).** Doug Newcomb, FIC chair, reported that FIC's top priorities are (1) to continue to support coordination between military bases and CGIA for orthoimagery acquisition and data sharing; the committee will seek to leverage success of orthoimagery cooperation and apply it to collection of other federal datasets; an example is the National Agriculture Imagery Program (NAIP) where federal and state agencies have cooperated on processing and data serving and will look for ways to continue that collaboration; and (2) communicating to state agencies what federal agencies are doing with statewide datasets to derive value. Mr. Newcomb added that federal agencies are doing a lot with Open Data, accessed through data.gov. He offered to arrange a presentation on Open Data from someone from data.gov, and he offered federal consultation on technical issues related to harvesting data from NC OneMap. The next FIC general meeting will be held on August 27 in Asheville.

GIS Technical Advisory Committee (TAC). Dan Madding, TAC chair, reported the TAC completed two of its four primary tasks—the raster compression document and the piece on hosting map services in the cloud. This year, TAC will take on the other two tasks—practices for data collection using mobile devices and technical architecture for GIS. For mobile data collection, TAC seeks a subject matter expert for more information on accuracy of GPS related to mobile devices. Also, TAC seeks advice on applications of Esri's Collector for GIS.

Mr. Duncan commented that Mr. Madding on behalf of NC Forest Service (DuPont Forest) and Henderson County cooperated on ordering color infrared imagery from the statewide imagery vendor in their area at a reasonable cost. Those products are expected after the 2015 true color imagery goes through quality control and is delivered to the Public Safety Answering Points in January 2016.

Management and Operations Committee (M&O) and NC OneMap Governance Committee. Mr. Duncan reported that the M&O is giving attention to preparation for Census 2020. He pointed out the value of statewide street centerlines and statewide parcels as source data for efforts to distinguish between residential and nonresidential addresses in the statewide address database for purposes of accurate population counts and accurate address points where sales tax is collected. Accuracy affects congressional representation and distribution of federal revenue to jurisdictions. Mr.

Duncan hears from Census officials that North Carolina is one of the top three to five states in address data. He emphasized the value of linking data to address points, including parcel information. Bob Coats, Office of State Budget and Management, is heading up the Council's committee on geospatial Census data and is working with Mr. Sewash on sharing data with the Census Bureau. Also, M&O is working on a concise Council Annual Report that will communicate the progress and value of the Council.

Technical Presentation
(See "NCLiDAR 2014-2015 Update" PPT file at GICC website - http://www.ncgicc.org/GICCMeetings.aspx)

John Dorman, Assistant Director of the NC Division of Emergency Management, gave the Council an update on statewide LiDAR. As background, the first generation of statewide LiDAR acquisition was completed between 2000 and 2005. The second generation of LiDAR acquisition began with flights in 2014 for the first two of five phases. Cooperation between North Carolina and US Geological Survey (USGS) resulted in elevation products delivered earlier this year for 40 counties. LiDAR was flown in early 2015 for another 19 counties in central North Carolina, with processing and quality control in progress.

The newer technology supports LiDAR points collected at Quality Level 2 (QL2) consistent with the national 3D Elevation Program (3DEP). Point spacing is two points per square meter. Accuracy level is 3.36 inches with 95 percent confidence. This generates significantly more points to better represent the elevation of bare earth (e.g., a stream bed). Shaded relief provides another view of the elevation. Points are classified as bare earth, vegetation, roads, buildings, and other classes. Points also have intensity values that provide an informative representation of the surface. Points returned from the top of features also enable profiles of those features such as buildings. Imagery may be combined with points as well to provide a third dimension. Mr. Dorman explained that LiDAR products can be used to represent features such as ponds, buildings, and roads much better than the previous generation of LiDAR.

The products from LiDAR for this generation are classified LAS points, hydrography breaklines based on USGS specifications, digital elevation models, terrain models by county, intensity images, metadata, and quality control reports. Data are available from the website http://rmp.nc.gov/sdd/, and counties receive copies of county-based data after quality control. The Spatial Data Download website access is authenticated by NCID and users are requested to fill out contact information before downloading data.

For phases 4 and 5 (2016-2017), Mr. Dorman described a new technology that is a "game changer" for LiDAR acquisition and elevation products. Geiger Photon Counting technology can acquire more points at a faster flight speed, at a higher altitude, with a wider collection area per flight path. In addition to the higher, faster flights for LiDAR acquisition, the points support higher resolution. The spacing of LAS points would be 8 per square meter (up from 2) based on collection of 20 points per square meter and selection of a subset of points. Pilot work in the Charlotte/Mecklenburg area with the Geiger Photon technology indicates that acquisition cost is equivalent to or less than the cost with the technology used in the first three phases. As an example, Mr. Dorman displayed points (only) representing electric transmission lines and power facilities at one of Duke Energy's sites. He displayed other examples in the Charlotte area with the dense, classified points.

Concerning funding to complete the five phase statewide project, Mr. Dorman acknowledged partners to the NC Floodplain Mapping Program who have contributed to the project: USGS, USDA-Natural Resources Conservation Service, NCDOT, military bases, and the General Assembly. He is seeking continued support from those and other partners to fund phases 4 and 5. He envisions future collection in the first 3 regions using the higher resolution data acquisition technology.

Mr. Newcomb commented that he serves as the US Fish & Wildlife Service representative on the 3D Elevation Program technical committee, and he sees that North Carolina stands out nationally in acquisition of LiDAR data and pursuit of the new technology.

In response to a question from Mr. Madding, Hope Morgan (NC Emergency Management) explained that rectification of orthoimagery typically uses a surface based on 50-foot or 100-foot digital elevation models (DEM) for best results for the imagery, not a higher resolution such as a 20-foot DEM. The new 50-foot DEM is available for phases 1 and 2. She explained statewide DEMs were applied to the 2010 statewide imagery, so the new DEMs will not save money in ortho-rectification processing. However, she does anticipate savings in terms of fewer image corrections required thanks to the newer DEMs.

Twyla McDermott added that the City of Charlotte is building a 3D model of the entire Mecklenburg County area using the previous LiDAR data. She plans to contact Ms. Morgan to discuss the new LiDAR data demonstrated today with respect to the City's project.

In response to a question from Matthew Helms, Ms. Morgan explained that the LiDAR elevation products from phases 1-3, at 2 points per meter, are not suitable for identifying small objects such as manhole covers and fire hydrants. LiDAR collected by Geiger Photon Counting, at 8 points per meter or more, would support identification of small objects like those. However, an automated process would require intensity imagery and probably a significant manual effort.

Mr. Duncan thanked Mr. Dorman, expressed appreciation for the LiDAR project, and anticipates benefits across the state.

Statewide Orthoimagery Program Update
(See "GICC Statewide Orthoimagery Status" PPT file at GICC website - http://www.ncgicc.org/GICCMeetings.aspx)

Tim Johnson commented on the value of the previous generation of LiDAR for statewide orthoimagery production. Having statewide LiDAR to begin with for statewide imagery in 2010 saved the taxpayers and the NC 911 Board substantial money. The orthoimagery program is looking forward to applying the new generation of LiDAR in 2016 to save time and money on corrections of digital elevation models.

Mr. Johnson reported that the Statewide Orthoimagery project team wrapped up the Northern Piedmont and Mountains 2014 phase. The Southern Piedmont and Mountains 2015 phase, the fourth of four phases of orthoimagery acquisition, includes 24 counties bounded by Cherokee County in the west and Scotland and Moore Counties in the east. It also includes Camp Mackall and a portion of Fort Bragg. This is a critical time of year during which the project team engages

project partners, Public Safety Answering Points (PSAP), and GIS coordinators in visual quality control. The process has started this month and continues into October. Distribution of imagery products will occur in January, with availability on NC OneMap in February, and closeout of the project in the spring after the final 60-day review cycle. This is the same workflow applied to previous phases and the same schedule. The county review period started August 10 with selected counties that enable the project team to review imagery from adjacent counties processed by different contractors to achieve early consistency. Weekly rollout of counties for quality review spans a five-week period. The review cycle for a county wraps up 30 days after the data is posted through the online tool, VOICE (i.e., the Virtual Online Inspection, Checking, and Editing). This process results in a thorough review, first by CGIA and NCDOT Photogrammetry to identify any systematic or prominent quality issues, and then by the PSAPs and local GIS coordinators.

Mr. Johnson explained that the 2015 project engaged five contractors and is required to deliver imagery that is visually consistent across contractor study areas. He displayed an example where two study areas meet. As required by contract, contractors acquire and process imagery in an overlapping area to insure visual consistency. The project team and contractors invest considerable attention to specifications well before visual release to support consistent images from county to county.

Looking ahead, the Coastal 2016 project is underway. CGIA is under contract to the NC 911 Board and is working on the Qualifications-Based Selection (QBS) Process that is required for each annual phase. The Coastal 2016 phase now includes 27 counties with the addition of Duplin and Columbus from the Eastern Piedmont region in a realignment that will enable imagery acquisition in the Fort Bragg area in one phase instead of two. The project is working on specifying the study areas for the phase.

Concurrently, the project team has been working with military installations seeking permission to acquire imagery. The team has reached a nine-year agreement between the US Marine Corps and the State Chief Information Officer that is ready for signatures. The agreement will allow flights over Marine Corps bases, achieve more efficient flying over and adjacent to the bases, and provide for delivery of imagery to the Marine Corps only. The project team has approval from the Air Force and is in the middle of the process with others including US Army-Sunny Point and the Coast Guard.

Compared to the Coastal 2012 project, the Coastal 2016 project will take advantage of the new and improved LiDAR, and apply new sensors that acquire images at higher altitudes for wider paths at the same resolution. Also, the project team has developed a process that compares imagery across county boundaries and between contractors soon after flights occur. The team meets with the contractors to identify ways to make the imagery consistent from one study area to the next. The project team is excited and expects improved efficiency and quality in the Coastal area from advances in data, technology, and methods.

Mr. Johnson anticipates strong local participation; for example, eight people in Gaston County government have signed up to review imagery. Participation by PSAP staff has been growing each year. Mr. Duncan commented that the short time period for local review benefits from extra sets of eyes.

NC OneMap Update
(See NCOM update PPT file at GICC website - http://www.ncgicc.org/GICCMeetings.aspx)

David Giordano, NC OneMap Database Administrator, reported on new and updated resources in the NC OneMap Geospatial Portal. John Cox, State Property Office, supplied annual updates to State-Owned Lands and Non-Public Schools. Routine quarterly updates occurred for Federal Lands, Managed Areas, Natural Heritage Element Occurrences, and Natural Heritage Program Natural Areas.

NC OneMap transferred superseded GIS data to the Department of Cultural Resources, State Archives, amounting to more than one gigabyte. Ever since the GeoMAPP project and the NC OneMap Retention Schedule formalized archiving of NC OneMap data, a total of more than 14 gigabytes of vector data has been transferred to State Archives (also note that approximately 18.6 terabytes of orthoimagery from the 2010 statewide project was archived in May 2015).

Cadastral data, as described earlier by the Working Group for Seamless Parcels, are now available for all 100 counties as Esri web service, Esri feature service, WMF, WFS, and downloadable data in shapefile format.

Mr. Giordano reminded Council members to update desktop GIS or web app connections to use "services.nconemap.gov" (the .com extension will not work now for services). For programmatic information, alternative extensions are redirected but he advised updating other links and bookmarks to "data.nconemap.gov" and "www.nconemap.gov."

GICC Member Announcements

Marc Burris announced that in July the State Board of Elections received an award from Google for technology innovation for a civic Application Program Interface (API) to relate voter addresses and polling places. Anyone can build their own applications to get information on polling places through the API and related data. The project began in 2009 with NC as one of the founders. The project has expanded to more than 20 states, with support from Pew Charitable Trusts. In 2014, the API was accessed 31 million times. (See https://www.votinginfoproject.org/news/how-voting-information-project-works/).

Mr. Newcomb announced that the Open Source Geospatial Foundation will hold a regional conference for open GIS next year in North America. Raleigh is one of four finalists as a host city.

Regarding the next NC GIS Conference, Mr. Johnson shared that a request for proposal was issued for an event management firm to begin work on the 2017 conference. After a firm is engaged, the first task will be a process to select a host city and facility by late this year.

Mr. Dorman asked about the status of a state GIS business plan and inventory of priority geospatial data. Mr. Duncan commented that the Management & Operations Committee has tried to tie into the GIS Report and State IT Strategy by the SCIO. Mr. Dorman suggested a survey of state and local governments to identify who has datasets that may benefit other stakeholders if communicated in a report or plan. An inventory of what we have and what we are doing would be valuable. For example, NC Emergency Management is collecting data on school facilities. Mr. Johnson referred to

recommendations in the SCIO's GIS Report that would help build a plan, and observed that the time may be right to put the information together and set a direction.

Ms. McDermott suggested an inventory of technical architecture and a collection of information about resiliency of technical infrastructure. Questions would relate to location of databases, local and cloud storage, disaster recovery, and ways to manage risk.

Ms. McDermott announced that the City of Charlotte received a national award from the Public Technology Institute for its master address management program. The City of Charlotte is not the addressing authority, but the City needed a more robust set of data. The system integrates data from three sources of address data, and produces a dataset and web services. The solution resulted in 40,000 (10 percent) more addresses than the addresses contained in the authoritative (county) source. The City's system has a reporting service that informs the authoritative source agency of an additional address for adjudication. (See http://www.pti.org/news/displaynews.asp?NewsID=229&TargetID=1).

Looking ahead to the November Council meeting, Mr. Duncan announced the tentative technical presentation—Kyle Snyder of NC State University on the topic of Unmanned Aircraft Systems (UAS).

ADJOURNMENT

There being no other business, the meeting was adjourned at 2:30 PM. The next meeting will be Thursday, November 19, 2015 from 1:00-3:00 pm at the Department of Public Instruction Board Room, Room 755, 301 N. Wilmington Street, Raleigh.

Presentations and reports are on the Council Website: http://www.ncgicc.org/GICCMeetings.aspx. Click on "GICC Meetings" and navigate to August 13, 2015 and the column on the right for presentations and documents presented during the meeting in a downloadable zip file.