North Carolina
Geographic Information Coordinating Council
Federal Interagency Committee

NCGICC

The Federal Interagency Committee met via Webex on April 14, 2020.Attendees

1. Scott Lokken (Chair) NOAA, National Geodetic Survey
2. Doug Newcomb FWS
3. Erik Hund NOAA Office for Coastal Management
4. William Beatty USFHWA
5. Kitty Kolb USGS
6. Matt Duvall NRCS
7. Tim Johnson NC CGIA
8. John Derry NC CGIA
9. Drew Pilant EPA

What would have been an in-person meeting was held as a remote teleconference meeting due to the COVID-19 lockdown.

William Beatty presented first. Due to technological issues because of the COVID-19 lockdown he was not able to present his planned presentation. He instead presented on what he is doing with the aftermath of Hurricanes Matthew, Florence and Dorian. The takeaway from his presentation was for yes or no questions to be answered levels of precision could take too much time and may not be cost effective.

Scott Lokken presented on NGS retiring the U.S. survey foot in 2022. Currently two versions of "foot" are in use:

- Old U.S. survey foot -1 ft = 0.3048006096… m
- New international foot -1 ft = 0.3048 m exactly
- Differ By 2 parts per million (ppm) or 0.01 ft/mile

These differences can be a real problem with real costs. Over a mile it is not a problem but when projected State Plane coordinates at a million feet.

Surveyors are really the only users of the U.S. survey foot (U.S. Survey Foot). They are also among the very few who even know of its existence. In schools and colleges, they only teach students about the official international foot (International Survey Foot) – without specifying that it is often called the "international foot." In addition, because people use the products created by surveyors, they end up using the U.S. Survey Foot without even knowing it.

Scott stated the central issue as a series of 6 facts.

1. Only Congress has the power to fix standards.

a. The authority of Congress is given in the U.S. Constitution, Article I, Section 8, Clause 5.
    i. Congress delegated its power to the Office of Weights and Measures in the Department of the Treasury.
    ii. National Bureau of Standards (NBS) then got this authority as the successor to the Weights and Measures, and NBS became part of Department of Commerce (DOC).
b. Why was something like standards of weights and measures so important that it was specifically listed as a congressional power in the Constitution?
    i. Because standards for weights and measures are tightly connected to commerce, including coining of money. We are going to come back to this near the end of the presentation.

2. Congress delegated standards authority.
    a. Today, the National Institute of Standards and Technology (NIST) is responsible for defining and establishing standards. It is within their authority.
    b. NIST is a bureau of the DOC.
    c. The National Oceanic and Atmospheric Administration (NOAA) is also a bureau of DOC.
    d. The National Geodetic Survey (NGS) is a program office in NOAA. It is within the National Ocean Service (NOS) in NOAA.
3. Mendenhall Order fixes foot to meter.
    a. The Mendenhall Order (1893): When the U.S. officially became metric.
        i. Officially adopted meter as basis of length, where 1 foot = 1200/3937 meter (per 1866 act of Congress), and with meter represented by Meter Bars No. 21 and 27.
        ii. Completely abandoned British Imperial Yard as basis for length (as represented by Bronze Bar No. 11).
    b. Declared in Appendix 6 of C&GS Bulletin No. 26, including conversion tables.
    c. Interesting to note that conversion showed 1 Gunter's chain = 20.1168 m
        i. That is EXACTLY 66 International Survey Foot (vs. 65.999868 U.S. Survey Foot)
        ii. This is just a coincidence due to rounding, but it shows that for the precision of the chain, the distinction between the International Survey Foot and U.S. Survey Foot is immaterial…
    d.
4. New foot defined (old named "U.S. survey foot")
    a. With increasing measurement precision and global trade, it became necessary to adopt a more precise definition of the foot, and one that agreed with international usage.
        i. A motivation for a new definition of the foot was in gage-block standardization for precise machine shop work used by industry. It was a practical solution to a practical problem. Note this has nothing whatsoever to do with surveying.
    b. The new (international) foot definition was 1 ft = 0.3048 m (exact) and is the same to this day (it will not change). The adoption of the International Survey Foot was a gradual process (as such things often are):
        i. 1933. Adopted by American Standards Association, now American National Standards Institute (ANSI).

ii. 1952. Adopted by National Advisory Committee for Aeronautics, now National Aeronautics and Space Administration (NASA).
iii. 1954. Adopted International Nautical Mile as exactly 1852 m. This is not related specifically to International Survey Foot but shows overall move toward adopting "exact" (non-ratio) relationships to the meter.
iv. 1959. NBS officially adopts International Survey Foot for the entire U.S., with one little notable exception…

5. Temporarily keep old foot for geodetic surveys
    a. In Federal register in 1959
    b. 1 foot = 1200/3937 meter
    c. Referred to as U.S. Survey Foot
6. Mandated end of old foot with new datum.
    a. The 1959 Federal Register Notice also mandated that international survey foot shall be adopted after readjustment of U.S. geodetic network
    b. Before the NAD83 adjustment National Geodetic Survey went to meters in the 1977 and all measurements were converted to meters. States were let to pick what they wanted for State Plane coordinates which for many was U.S. Survey Foot.

NGS and NIST have decided that there be only ONE official definition of the foot after 2022.

- Considering getting rid of word "international", and just call it the "foot" (that is how it is handled in some software, such as ESRI's).
- Have NO option for U.S. Survey Foot after 2022. It will only be used for the past (legacy applications).

National Geodetic Survey will help in the transition

- All NGS products will be backward compatible from 2022 to NAD83.

There are other changes coming in 2022:

- The change from U.S. Survey Foot to International Survey Foot is really just a small (2 ppm) scale change. That is smaller than the change in scale for SPCS2022 zones, and that is only PART of the change that will occur for State Plane.
- Coordinates in NSRS2022 will change with time. In fact, the entire frame will be time dependent. Assumptions about control coordinates never changing will have to be abandoned.
- The "vertical" datum will be replaced with a geopotential datum based on a gravimetric geoid (rather than leveling). This, too, will have a time-dependent component.
- There will be changes in how GNSS, leveling, and total station survey surveys are performed, reduced, processed, and adjusted.
- By comparison, the change from U.S. Survey Foot to International Survey Foot is so miniscule that it is well within the noise of the other changes.

Federal Register Notice October 17, 2019 (link on NGS homepage) spells out all the changes that will take place and there is a section for comments. It also spells put that after 2022 the U.S. Survey Foot will be superseded by the Foot.

NC OneMap Gaps to Fill

John Derry and Tim Johnson presented on NC OneMap data gaps.

There are a few datasets gaps that NC CGIA feels the FIC could help fill which are soils, wetlands, landcover and federally owned lands.

Soils – There are services out there such as the web soil survey

- https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx
- ArcGIS Online data layers

Matt Duvall NRCS: Web Soil Survey is the authoritative source for distribution for soils information. There are no other sources that the agency endorses. Don't know if there is a web service you are looking for.

Tim Johnson: How would a user get to the data most efficiently?

Matt: We recommend Web Soil Survey. It is the authoritative source for distribution. It is also a place where a user can download that own version and work with it locally. SSURGO datasets that you can download locally don't provide much information unless you use something like Soil Data Viewer which provide reports what the soils information is otherwise you just get a map unit label which is fairly useless to most people.

John Derry: So, just serving a webservice with just a line wouldn't mean much?

Matt: I'm not sure you could provide a service to deliver the relevant soils information and make it meaningful. You would have to organize it by horizon, map units might have more than one type of soil it you would have to decipher if it's the dominant component or the minor include component. It's a very complex dataset. What the user wants an interpretation. Is the ground suitable for winter logging? We have those interpretations within NRCS tools. There's really know way to bring that information forward as a service. These specific interpretations would have to be prebuilt as a service.

Matt: Keep in mind if we are talking about custom solutions over North Carolina over NC OneMap, soils survey is updated annually. It would require a massive data refresh every year.

Tim: Matt one of the things we wanted confirm with this committee are there 100 counties of detailed soils in place and I think I know the answer.

Matt: The initial soil survey is complete for 100 counties but not all soil surveys are created equally. Some were started in the 40's and others were complete as of a few years ago. So, the answer is but they area apples and oranges depending on what area you are looking at.

Tim: John, need to more on this one.

Matt: Try to find out who is responsible for web soil survey in the agency and try to connect you with their technicians.

Matt: In the past we produced custom interpretations for all 100 counties every year and delivered them to NC OneMap. Staffing cuts changed the ability to do that anymore. There is a new state soil scientist and weight want to reach out to them. He did invite the soil scientist to this meeting.

Scott Lokken: Can you jot down a couple of sentences and send them to John? (He did)

Wetlands - We know there is talk of removing wetlands from USGS hydrography dataset. What is the best service for wetlands? NWI services are out there.

Doug Newcombe (FWS): FWS is the wetlands mapping agency. Wetlands on the USGS hydro was a legacy from 250k and 100k. It was more decoration then wetland delineation. Jurisdiction delineation is done by USACE. NWR wetlands are non-jurisdictional and represent the generalized wetlands habitats. For purposed of regulation, that is performed by USACE. They are working on technological means of updating NWI. NISAR satellite goes up 2021 L-Band could help. Will be doing a 10m waterbody extent globally every 6 days. Also soil moisture. Could provide better wetlands extent.

Tim: Part of the issue in supporting the Council is if there is a webservice and is it current. Is there a webservice for NWI and is it current?

Doug: NWI wetlands is actually part of the National Map. Line work is not responsive raster version is faster. Raster might have the classifications when zooming in.

Tim: We just need to make sure David Giordano has access to what is currently available. For future datasets what is the timeline for when it will be available for NC?

Doug: The updated wetlands is still in the discussion phase for when to do it. Still updates from aerial photography. Somewhere done from 2010 or 2012 photography for coastal quads. Discussion in FWS is how get better automation and more up to date wetland delineation.

Doug: might contact Meghan Lang technical lead FWS to see how those discussions are going.

https://www.fws.gov/wetlands/arcgis/rest/services/WetlandsTopo/WetlandsTopoService/MapServer

Landcover - NOAA is currently working on a pilot for two counties on the coast of NC. This could help guidance for future collection efforts. The GICC is looking to the FIC to provide guidance for products that can be derived like impervious surfaces.

https://www.mrlc.gov/data-services-page

Erik Hund: Have you been in contact with Nate Herrold?

John: For the coastal project, it has been over a year.

Erik: From the coastal project, we have a pretty good impervious surface layer we can share,but for the rest of the landcover that is still in progress. He will let Nate know and we can share impervious surface layer.

John: Yes, for these two counties?

Erik: Yes, New Hanover and Brunswick. I will contact Nate then.

Tim: what we are looking for are "building blocks" for these two counties that could be extended to the rest of the state.

Federally Owned Lands - Datasets and web services do exist for this layer but there are discrepancies between what the federal and local datasets.

a. 2013 established a subcommittee to address this problem.
b. Natural Heritage Program (NHP) are the state steward for the Protected Areas Database (PAD)
c. NHP created the **Federal Lands in North Carolina** for the NC OneMap
d. NHP no longer does the Federal extract of the dataset for NC OneMap.
    i. NHP doesn't want it to be construed as the sole authority for the dataset

Tim: Interested in anyone's thoughts on the Federal Owned Lands

Doug: PAD US 2.0 just came out late last year. I thought USGS was coordinating the dataset. Silvia

Silvia: Not sure but could find out.

Doug: There always going to be a lag between change in status. FWS has a lands layer through ArcGIS online. These are authoritative layers. PAD US is probably the place to start.

Silvia: putting to links in chat.

https://viewer.nationalmap.gov/services/

https://www.usgs.gov/news/major-update-america-s-inventory-parks-and-other-protected-areas-protected-areas-database

Topics shared at last GICC meeting:

UAV

- There is testing going for localized drone delivery
- Remote ID is going to be required in the future for drones which will make all existing drones obsolete. Before anyone invests in a new drone, investigate whether this has remote ID.
- If you don't have a Remote ID, you must fly in an FAA-recognized identification area.
- The Remote ID will help lay the foundation for an Unmanned Aircraft System Traffic Management System (UTM) that is scalable to the national airspace.

Census Differential Privacy

- Due to privacy concerns, the census will be introducing noise in the data to protect confidentiality.
- Data accuracy will decrease
- Generally, large population areas lose population while small population gain
- Discussion is still going on.

- Differential Privacy will be used on the 2020 Census and on other Census surveys late.

Tim:

- The GICC will vote on the survey foot vs. the international foot.
- There will be differential privacy injected into the 2020 Census will be done in some fashion.
- Geospatial Maturity Assessment. Performed by the National States Geographic Information Council (NSGIC). The assessment took a fresh look at maturity of GIS operations in each state in the country. They then graded each state based on a survey of framework datasets.
    - 41 out of 50 states responded.
    - No State got an A.
    - NC got a B+ which was the highest.
    - **A**'s for parcels, elevation, geodetic control, leaf off imagery and transportation
    - **B**'s for hydrography (need a cohesive plan that not only supports the Fed's but the state and local community), governmental units and addresses.
    - Need to focus on our B's.
    - Survey will be done every 2 years
    - Will help the states with the Geospatial Data Act.

Roundtable Sharing

Matt Duvall (NRCS): Working with Doug Newcombe scanning archival imagery from the 60's, 70's and 80's in the Albemarle-Pamlico Sound estuary.

Doug Newcombe: there is project scanning USDA NHAP imagery 1:58,000. Doesn't know where NC sits on that progress.

- Doug translation: *The date range of NHAP photography available is 1980 - 1987. Two scales of photography were secured simultaneously; a scale of 1:80,000 is exposed on black-and-white panchromatic film, and the 1:58,000 is exposed on color infrared positive film.*

Doug (FWS): Tim, are there state georeferencing specifications for scanned imagery?

Tim (CGIA): That would be a question for Ben Shelton.

Silvia (USGS): USGS is close to publishing elevation derived hydrography specification for deriving hydrography from LiDAR data. For coding and capture and having elevation and hydrography matching. Not telling contractors how to do it but what the final product should look like.

Scott Lokken (NGS):

Webinar series:

- Gravity at NGS: Why We Need it and How We Measure It.
- NOAA Shoreline and Geospatial Products Review.
- GPS on Benchmarks: 2022 Transformation Tool Campaign Update

Erik Hund (NOAA): Stephen White is working with Gary Thompson flying deep channel topo bathymetric Lidar. They are also collecting imagery. They are about done with the area they are working on. Scott asked for a presentation on the project.

Work Plan Review

Scott: Asks FIC group to see where they fit into the plan. Alerts group fiscal year ends June30. Report is due soon. Get items what individuals are working on to either John or Tim.

Scott reminds the FIC members to be alert for potential grant solicitations that each of their individual agencies might be making available that could benefit the state.

Tim: Staff leading the parcel effort are always looking for attributes the users need the most. FIC should weigh in on what attributes they would need the most.

Silvia: Attributes consistent between counties such as taxable vs. non-taxable, private vs. public.

*Tim, I spoke with Anna about this attribute. She's looking into it.

FIC Executive Committee and Plans for 2020-2021

In-person FIC general meeting in Charlotte at USGS facility possibly in November.