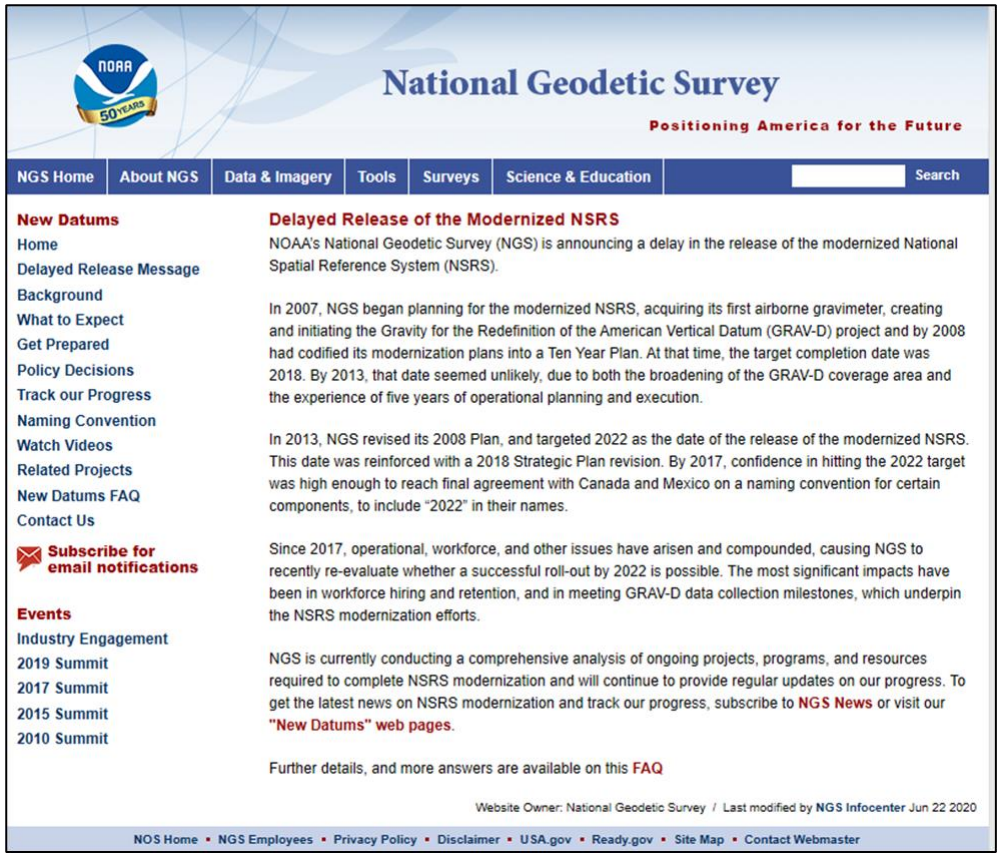
North Carolina Geodetic Survey (NCGS): Positioning NC today and for the future!

Land Records Workshop

New Datums are Coming in Spring 2026



National Geodetic Survey

Positioning America for the Future

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Delayed Release of the Modernized NSRS

NOAA's National Geodetic Survey (NGS) is announcing a delay in the release of the modernized National Spatial Reference System (NSRS).

In 2007, NGS began planning for the modernized NSRS, acquiring its first airborne gravimeter, creating and initiating the Gravity for the Redefinition of the American Vertical Datum (GRAV-D) project and by 2008 had codified its modernization plans into a Ten Year Plan. At that time, the target completion date was 2018. By 2013, that date seemed unlikely, due to both the broadening of the GRAV-D coverage area and the experience of five years of operational planning and execution.

In 2013, NGS revised its 2008 Plan, and targeted 2022 as the date of the release of the modernized NSRS. This date was reinforced with a 2018 Strategic Plan revision. By 2017, confidence in hitting the 2022 target was high enough to reach final agreement with Canada and Mexico on a naming convention for certain components, to include "2022" in their names.

Since 2017, operational, workforce, and other issues have arisen and compounded, causing NGS to recently re-evaluate whether a successful roll-out by 2022 is possible. The most significant impacts have been in workforce hiring and retention, and in meeting GRAV-D data collection milestones, which underpin the NSRS modernization efforts.

NGS is currently conducting a comprehensive analysis of ongoing projects, programs, and resources required to complete NSRS modernization and will continue to provide regular updates on our progress. To get the latest news on NSRS modernization and track our progress, subscribe to NGS News or visit our "New Datums" web pages.

Further details, and more answers are available on this FAQ

Website Owner: National Geodetic Survey / Last modified by NGS Infocenter Jun 22 2020

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Get Prepared

1. Transform Data

Tools will be available to transform your coordinates from historic datums (NAVD 88, NAD 83, etc.) to coordinates in the modernized NSRS at the first reference epoch of the modernized NSRS (2020.00) using **NGS Coordinate Conversion and Transformation Tool (NCAT)**.

NOTE: Depending on your accuracy requirements, consider saving original observation files and/or plan for re-observations.

2. Record Metadata

Knowing the datums and epochs for your geospatial files will simplify your datum transformations, so require complete metadata in all surveying and mapping contracts.

3. Perform GPS on Bench Marks Operations

Obtain accurate NAD 83 ellipsoid heights on NAVD 88 bench marks to improve the transformation tool for the new geopotential ("vertical") datum.

4. Review State Plane Coordinate System of 2022 (SPCS2022) requirements

SPCS2022 policy and procedures documents and forms give the requirements for developing SPCS2022. The procedures and forms include contact information and instructions for requesting and proposing SPCS2022 zones.

5. Prepare to update legislation, as needed

The National Society of Professional Surveyors (**NSPS**), the American Association of Geodetic Surveying (**AAGS**), and NGS created **template legislation** to aid states in transitioning their legislation to new wording. Contact NSPS, AAGS, your state affiliate, or your local chapter for more information. Examples of new state legislation are available for **download**. The map below shows the status of legislation for the State Plane Coordinate Systems of 1983 and 1927 for all U.S. states and territories.

What about state plane coordinates?

NGS will likely define State Plane Coordinates (SPCs) through the same projections and zones associated with NAD 83. See our **FAQ** to learn more.

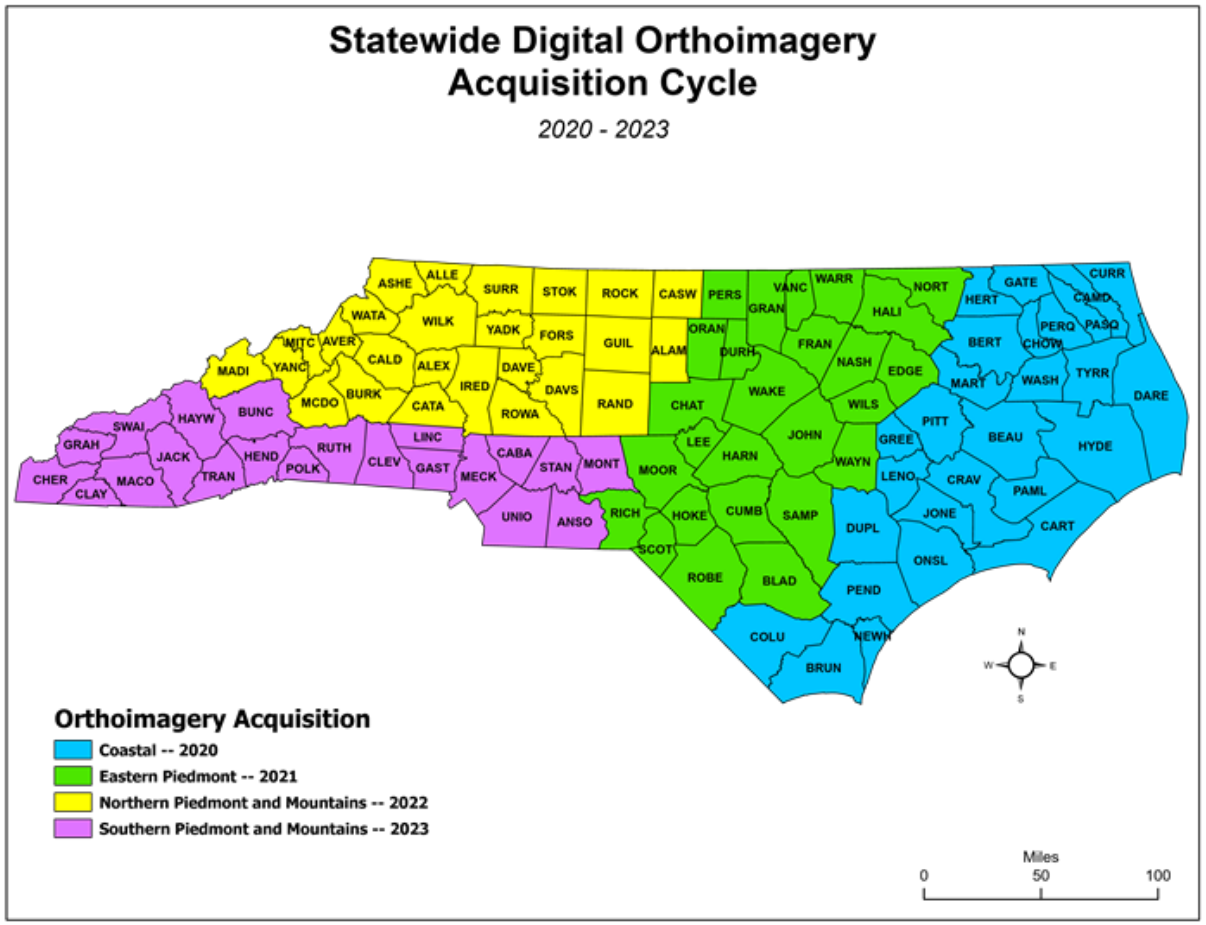
SPCs are converted from meters using the conversion factor as defined by the individual states who have requested that NGS publish SPCs in feet. The two conversion factors are:

The International Foot
1 inch = 2.54 centimeters

The U.S. Survey Foot
1 meter = 39.37 inches

HB814

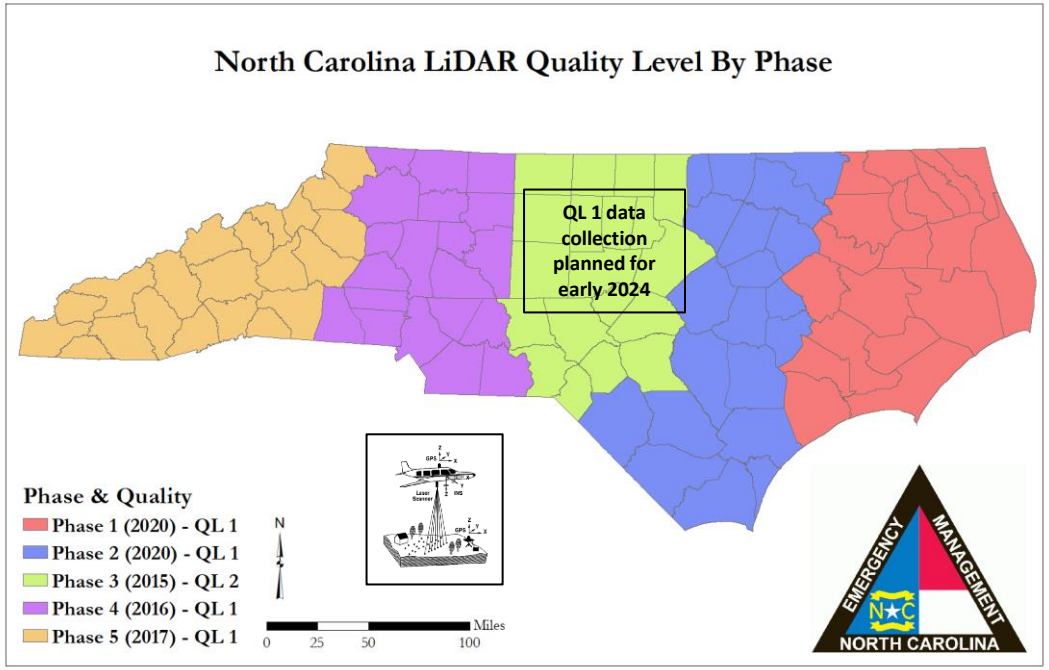
Statewide Imagery



NAD83(2011), NAVD88, and US Survey Foot will be used to collect new imagery in 2028.

The new datums and the International Foot will be used when we start imagery data collection in 2028 in the Coastal project area.

NC Light Detection and Ranging (LiDAR) Elevation Data



QL = Quality Level

NAD83(2011), NAVD88, and US Survey Foot will be used to collect new LiDAR data in Phases 3, 4, 5

The new datums and the International Foot will be used when we start the 4th phase of statewide LiDAR data collection

New Reference Frame Names

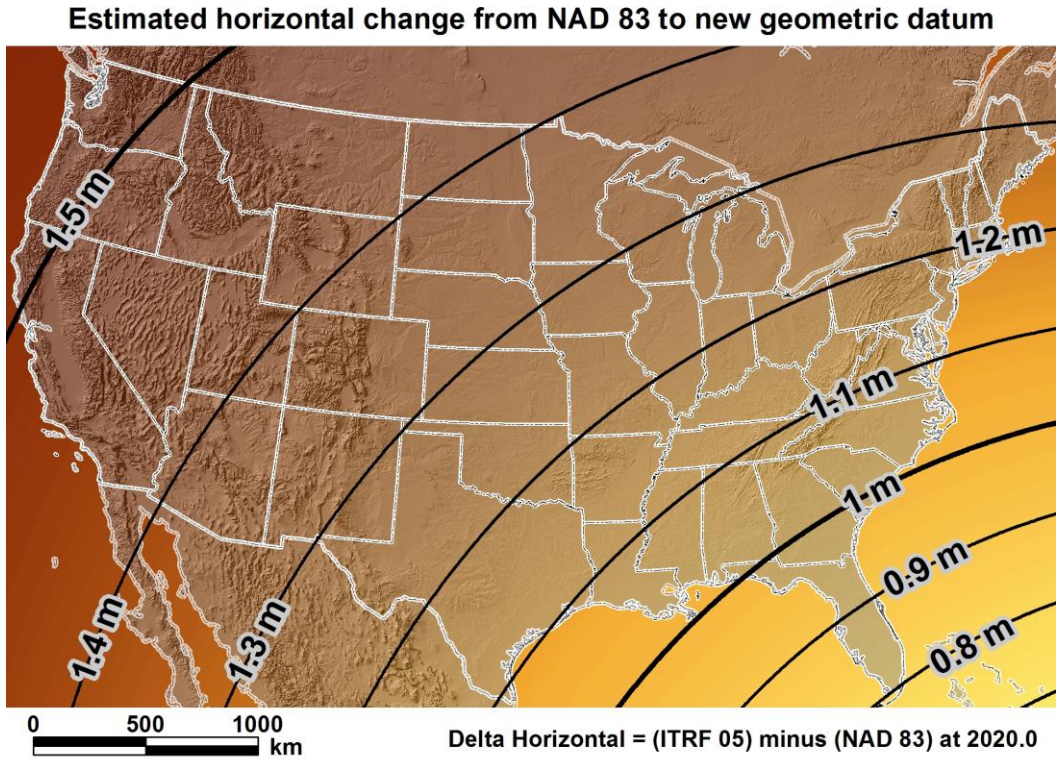
North American Datum of 1983 (NAD83) becomes:

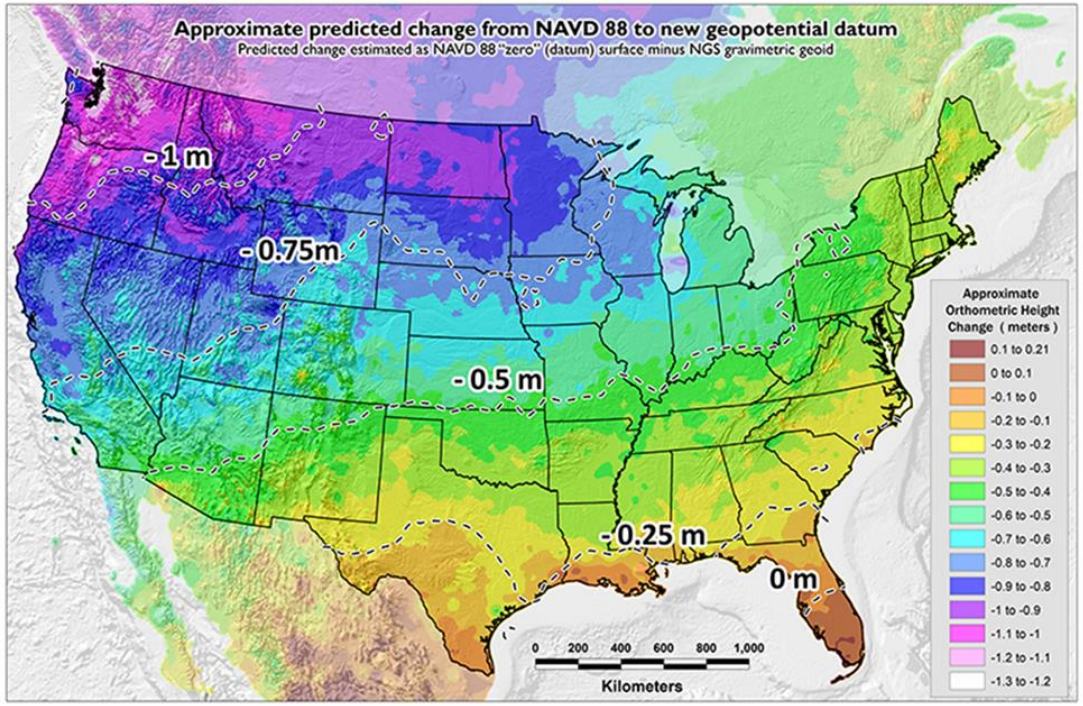
- North American Terrestrial Reference Frame (NATRF2022)
- Caribbean Terrestrial Reference Frame (CATRF2022)
- Mariana Terrestrial Reference Frame (MATRF2022)
- Pacific Terrestrial Reference Frame (PATRF2022)

North American Vertical Datum of 1988 (NAVD88) becomes:

- North American-Pacific Geopotential Datum of 2022 (NAPGD2022)

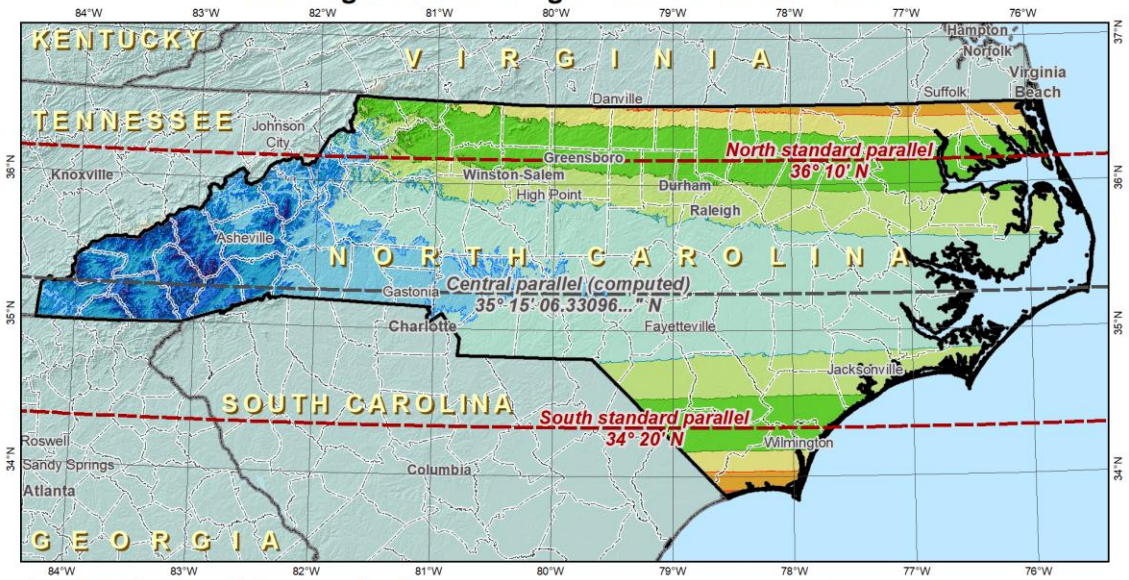
(Realized by GEOID2022)





ITRF = International Terrestrial Reference Frame

Existing SPCS 83 design: North Carolina Zone



Lambert Conformal Conic projection
North American Datum of 1983
Central parallel: 35° 15' 06.3..." N
Cen parallel scale: 0.999 872 592...

Areas within ±100 ppm distortion (±0.53 ft per mile):
44% of entire zone
42% of all cities and towns
44% of population

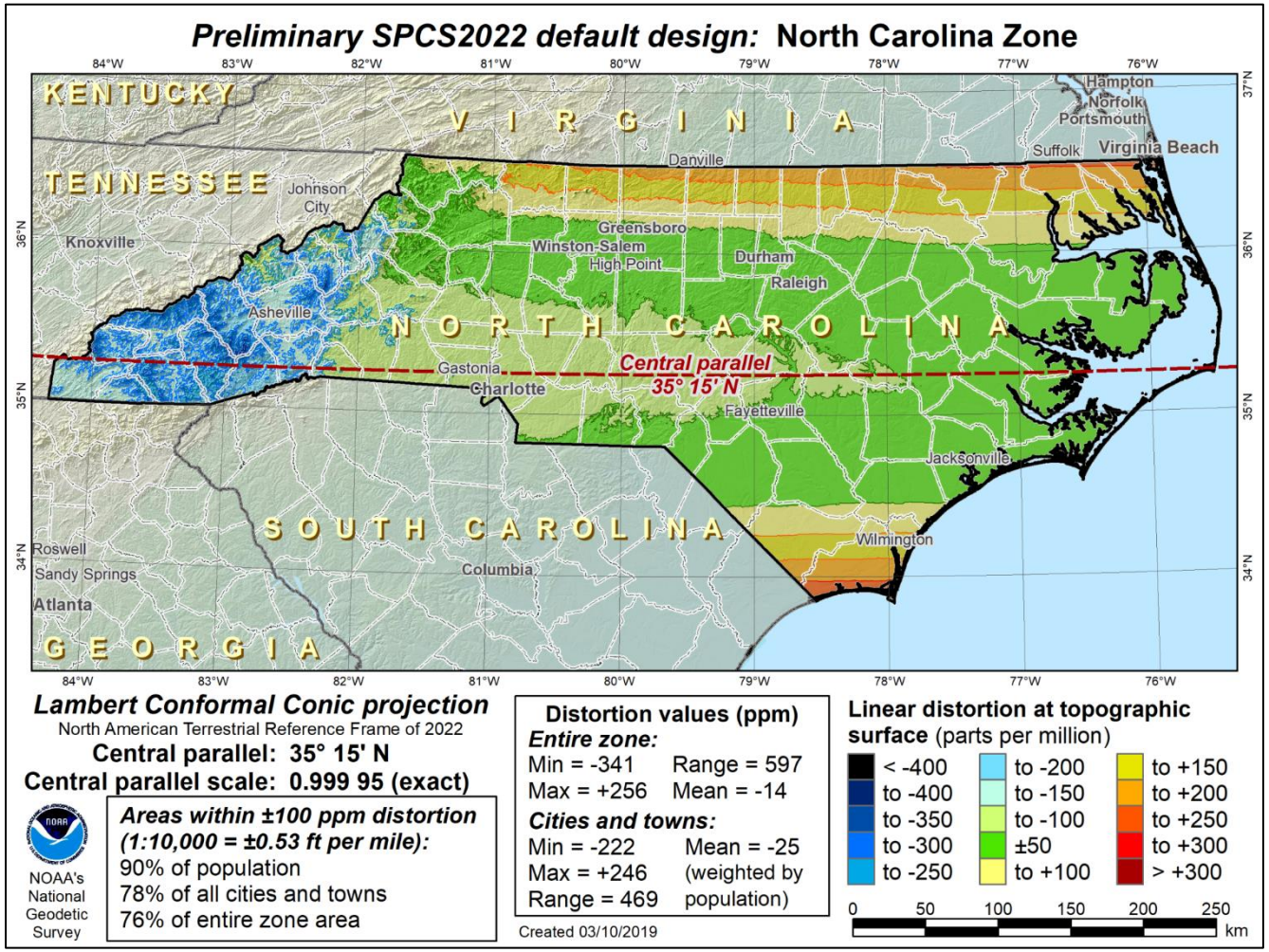
Distortion values (ppm)
Entire zone:
Min = -418 Range = 597
Max = +179 Mean = -91
Cities:
Min = -300 Range = 469
Max = +169 Median = -109
Mean = -103
(weighted by population)

Linear distortion at topographic surface (parts per million)

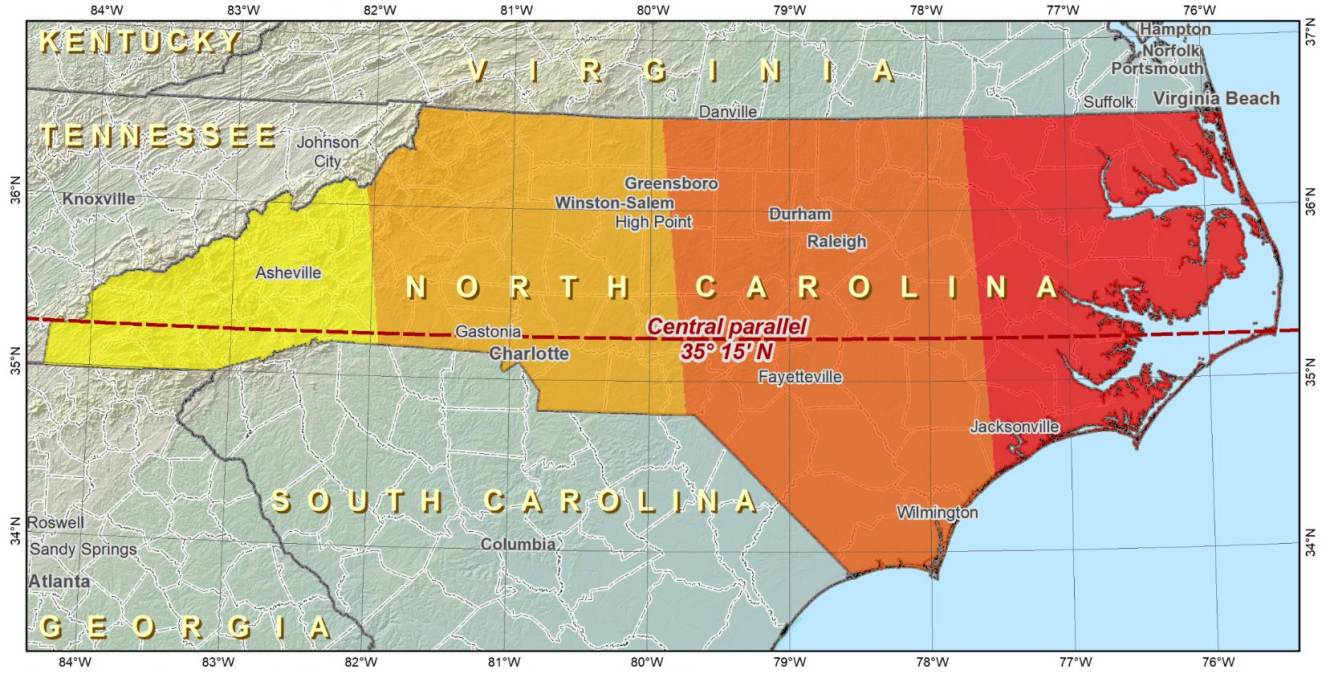
< -400	to -200	to +150
to -400	to -150	to +200
to -350	to -100	to +250
to -300	±50	to +300
to -250	to +100	> +300

0 60 120 180 240 km

SPCS = State Plane Coordinate System
ppm = parts per million
ft = feet
m = meter
km = kilometer
Min = Minimum
Max = Maximum
N = North


Preliminary SPCS2022 default design: North Carolina Zone
KENTUCKY
VIRGINIA
TENNESSEE
NORTH CAROLINA
SOUTH CAROLINA
GEORGIA
Hampton
Norfolk
Portsmouth
Suffolk
Virginia Beach
Danville
Johnson City
Knoxville
Greensboro
Winston-Salem
High Point
Durham
Raleigh
Asheville
Central parallel
35° 15' N
Gastonia
Charlotte
Fayetteville
Jacksonville
Wilmington
Roswell
Sandy Springs
Atlanta
Columbia
84°W
83°W
82°W
81°W
80°W
79°W
78°W
77°W
76°W
37°N
36°N
35°N
34°N
Lambert Conformal Conic projection
North American Terrestrial Reference Frame of 2022
Central parallel: 35° 15' N
Central parallel scale: 0.999 95 (exact)
NOAA's National Geodetic Survey
Areas within ±100 ppm distortion (1:10,000 = ±0.53 ft per mile):
90% of population
78% of all cities and towns
76% of entire zone area
Distortion values (ppm)
Entire zone:
Min = -341
Range = 597
Max = +256
Mean = -14
Cities and towns:
Min = -222
Mean = -25
Max = +246
(weighted by
Range = 469
population)
Created 03/10/2019
Linear distortion at topographic surface (parts per million)
< -400
to -400
to -350
to -300
to -250
to -200
to -150
to -100
±50
to +100
to +150
to +200
to +250
to +300
> +300
0
50
100
150
200
250
km

Horizontal change in SPCS2022 coordinates for North Carolina *(option 2b)*



Lambert Conformal Conic projection
North American Terrestrial Reference Frame of 2022
Central parallel: 35° 15' N
Central parallel scale: 0.999 95 (exact)

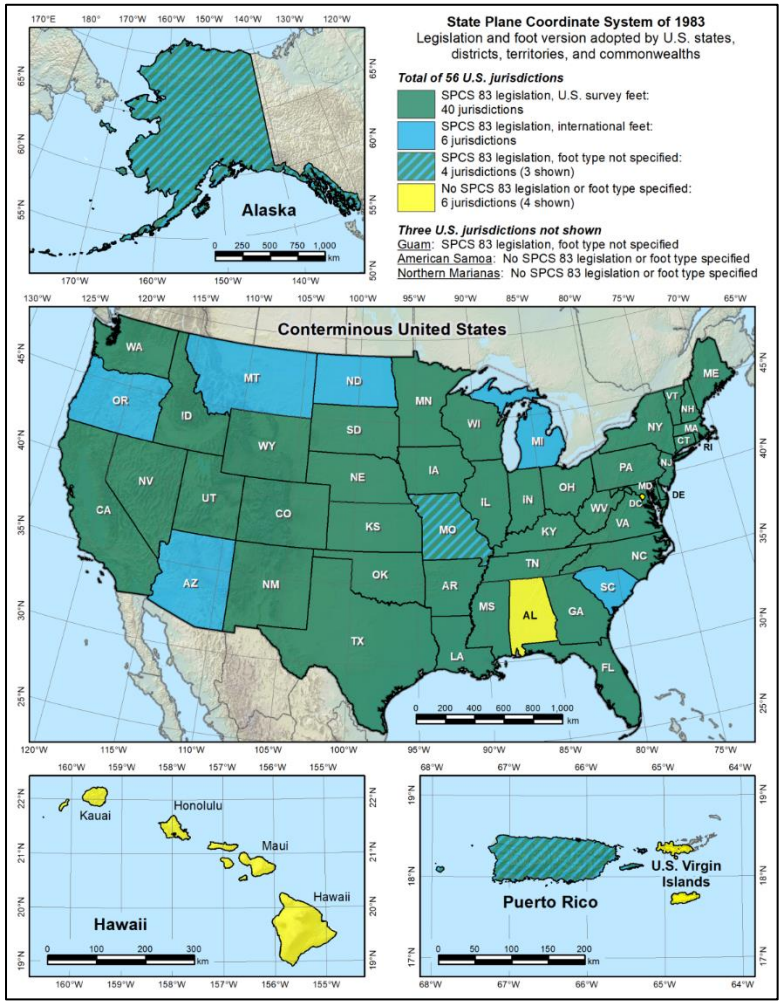
NOAA's National Geodetic Survey

Areas within ±100 ppm distortion (1:10,000 = ±0.53 ft per mile):
90% of population
78% of all cities and towns
76% of entire zone area

Option 2b: *Reference frame plus parameter change:*
False northing = 200,000 m
False easting = 1,000,000 m
(same central meridian as SPCS 83)

Horizontal change in coordinates
1,285,445 to 1,285,500 sft
1,285,500 to 1,285,550 sft
1,285,550 to 1,285,600 sft
1,285,600 to 1,285,650 sft

0 50 100 150 200 250 km



The Retirement of the United States (U.S.) Survey Foot

Now that we have stepped into a new year it is time to put an international foot forward. The U.S. survey foot was retired at the end of 2022 by the National Institute of Standards and Technology (NIST) and the international foot is stepping up to take its place. This is due in part to the modernization of the National Spatial Reference System (NSRS) and to provide national uniformity in measuring length.

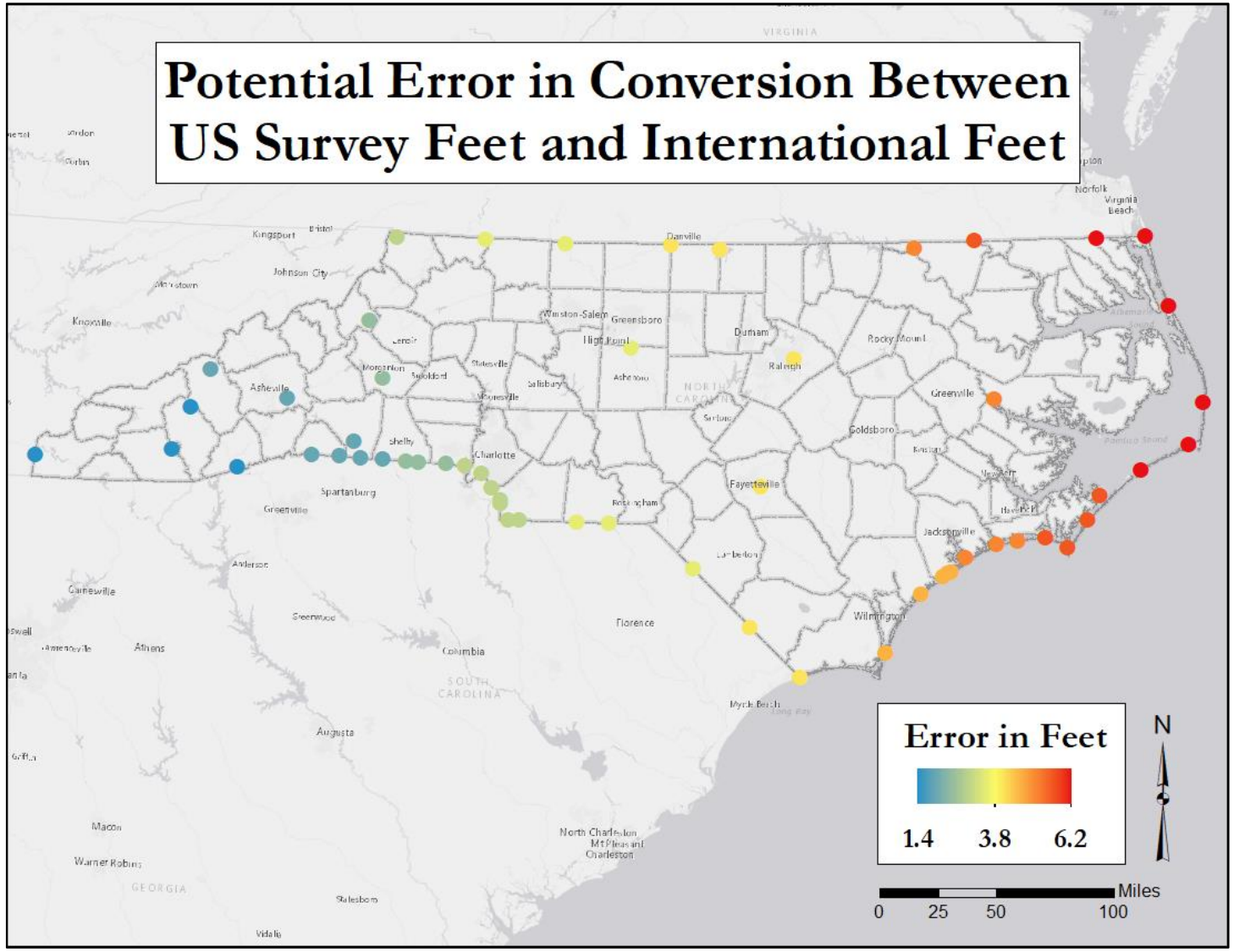
In North Carolina, the U.S. survey foot is defined in North Carolina General Statute 102-1.1 as the conversion from meters, with one meter being equal to 39.37 inches or a little over 3.28 feet. North Carolina will continue to use the U.S. survey foot for surveying, mapping and other activities that utilize the current North Carolina State Plane Coordinate System until NOAA's National Oceanic Atmospheric Administration) National Geodetic Survey (NGS) publishes the 2022 datums in 2025. **The North Carolina Geodetic Survey recommends that the U.S. survey foot be used with the current horizontal (North American Datum of 1983/2011) and vertical (North American Vertical Datum of 1988) datums. The international foot will be used in North Carolina when the new datums are published by NGS in 2025.**

The U.S. survey foot was originally adopted in 1893 but was updated in 1959 by a difference of two parts per million shorter, or the equivalent of approximately 1/100 of a foot per mile. This change was adopted by several other nations and came to be known as the international foot, moving the world a tiny leap forward. Tiny unless you are measuring hundreds of miles or more or working in the State Plane Coordinate System, then that difference can be measured in feet and that impacts things such as mapping and surveying.

The NSRS standard unit of measurement is a meter, which is in line with the international foot and many applications in the United States have been using the international foot for a long time. However, the 1959 change allowed for a temporary use of the U.S. survey foot for geodetic surveying until the geodetic control networks of the United States could be adjusted. The readjustment was completed in 1986 but the U.S. survey foot continued to march on in most of the states. The intent of the Federal Register Notice to retire the U.S. survey foot by NIST and NGS is to finalize its departure into the history books and use the international foot in conjunction with the modernization of the NSRS in 2025.

Additional information concerning the retirement of the U.S. Survey Foot can be found at this link.

https://www.nist.gov/news-events/news/2023/01/new-years-eve-2023-marked-retirement-us-survey-foot


Potential Error in Conversion Between US Survey Feet and International Feet
Error in Feet
1.4
3.8
6.2
N
Miles
0
25
50
100
VIRGINIA
NORTH CAROLINA
SOUTH CAROLINA
GEORGIA
Kingsport
Bristol
Johnson City
Knoxville
Asheville
Winston-Salem
Greensboro
High Point
Durham
Raleigh
Rocky Mount
Greenville
Goldsboro
Fayetteville
Jacksonville
Wilmington
Charlotte
Shelby
Spartanburg
Greenville
Anderson
Greenwood
Columbia
Florence
Myrtle Beach
Augusta
Athens
Macon
Warner Robins
Statesboro
Danville
Norfolk
Virginia Beach

Action Item

Adoption of Rule (always use US Survey foot with NAD83 (2011 and other historical datums)

REQUIRED FOOT CONVERSION

When coordinates are provided in feet, the conversion between the foot and meter shall be based on the coordinate system used for determining the coordinates. This requirement applies to horizontal plane and vertical coordinates, and to all values associated with or derived from these coordinates. That includes, but is not limited to, distance, elevation, height, area, and volume, along with values computed from the foot, such as the chain, pole, rod, mile, square mile, and acre. The following foot conversion shall be used:

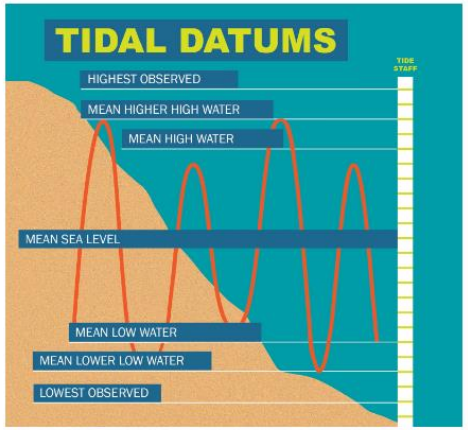
1. The International Foot, 1 foot = 0.3048 meter exactly, when coordinates are based on the North American Terrestrial Reference Frame of 2022 (NATRF2022) as described in §102-1.2 of the North Carolina General Statutes, and for all subsequent coordinate systems adopted by the North Carolina Geodetic Survey or its successor.
2. The U.S. Survey Foot, 1 foot = 1200/3937 meter exactly or 1 foot = 0.304800609601219 meter approximately, when coordinates are based on the North American Datum of 1983 (NAD 83) or the North American Datum of 1927 (NAD 27) as described in §102-1.1 or §102-1, respectively, of the North Carolina General Statutes.

National Tidal Datum Epoch

The National Tidal Datum Epoch (NTDE) is a 19-year time period established by the National Ocean Service for collecting observations on water levels and calculating tidal datum values (e.g. mean sea level, mean lower low water). The NTDE needs to be regularly revised to account for long-term effects of land movement, sea level rise, and changes in tidal constituents. Tidal datums and their data are used to generate products and services necessary for safe navigation, coastal hazard mitigation, ecosystem research, coastal engineering, and marine boundary demarcations.

The NTDE Update: New Tidal Datums are Coming!

NOAA currently utilizes the 1983-2001 National Tidal Datum Epoch. This epoch is now undergoing revision and will be replaced by the fifth iteration of the NTDE. Measurements for the update will be based on water level data spanning the years 2002-2020. Once all data has been collected, NOAA will review, analyze, and generate revised datums. The current proposed release date for new NTDE products is 2025.



The National Ocean Service ensures the nation has access to accurate tidal datums, which are the official datums depicted on nautical chart products and tide tables.

Recent News

Read our web stories for the latest news about the NTDE.

Impacts To You

Learn what an NTDE update will mean for members of your community.

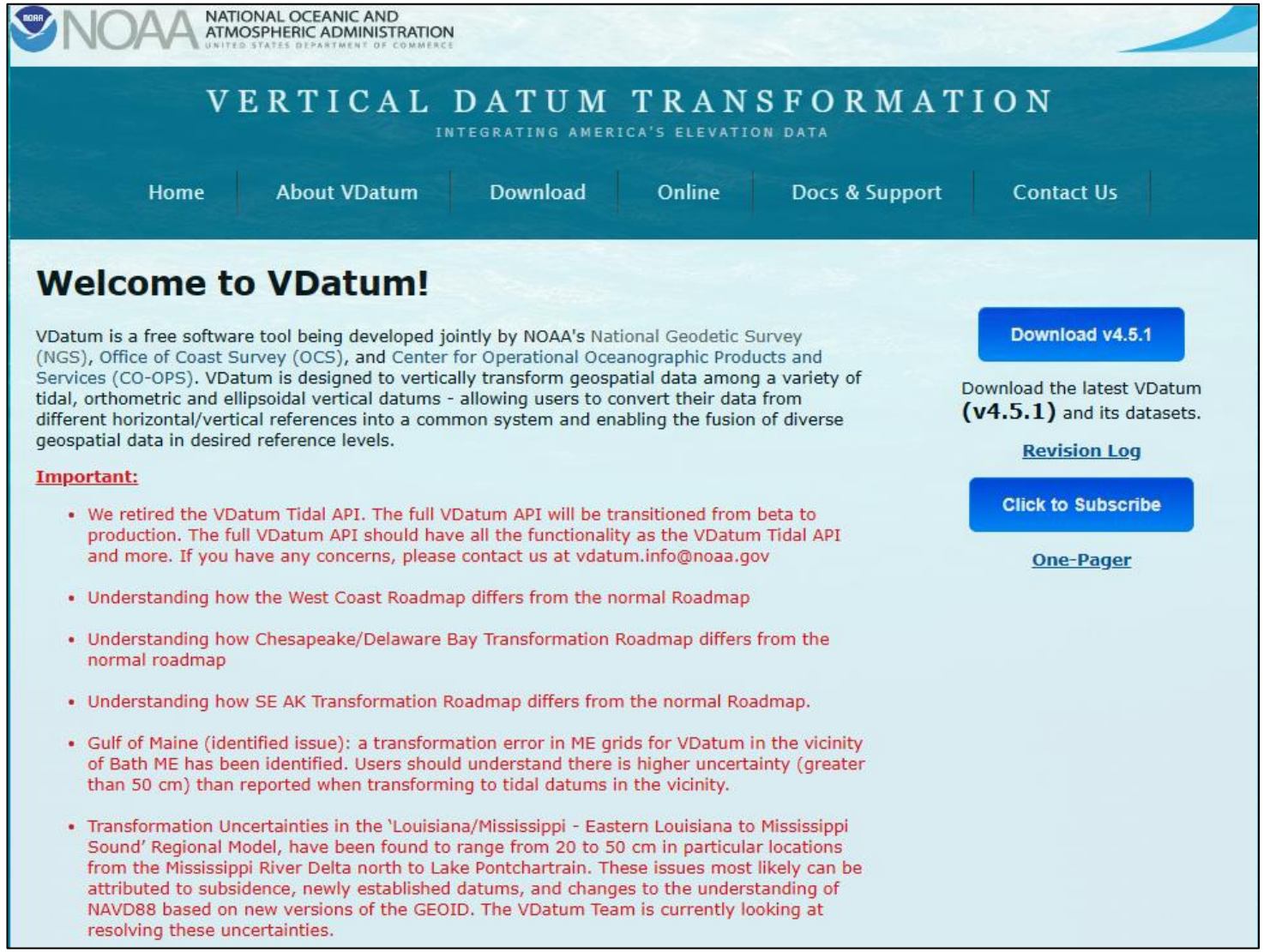
Contact Us

If you have general questions about the National Tidal Datum Epoch or the 2020 update, please email us at tide.predictions@noaa.gov.

For media-related inquiries, please contact nos.co-ops.commsteam@noaa.gov.

How will the NTDE update impact professional land surveyors?

Professional land surveyors (PLS) will see the following changes. When accessing tidal datum information they will need to ensure that they are using the currently accepted NTDE for all projects. Historical projects may need to be updated to reflect the new datum. The NOAA VDatum tool will be updated in time to include the new tidal as well as geodetic datums to enable PLS to obtain tidal geodetic relationships for the coastal zone of the Contiguous US, Puerto Rico, US Virgin Islands, and SouthEast Alaska.



NOAA NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
UNITED STATES DEPARTMENT OF COMMERCE

VERTICAL DATUM TRANSFORMATION
INTEGRATING AMERICA'S ELEVATION DATA

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Welcome to VDatum!

VDatum is a free software tool being developed jointly by NOAA's National Geodetic Survey (NGS), Office of Coast Survey (OCS), and Center for Operational Oceanographic Products and Services (CO-OPS). VDatum is designed to vertically transform geospatial data among a variety of tidal, orthometric and ellipsoidal vertical datums - allowing users to convert their data from different horizontal/vertical references into a common system and enabling the fusion of diverse geospatial data in desired reference levels.

Important:

- We retired the VDatum Tidal API. The full VDatum API will be transitioned from beta to production. The full VDatum API should have all the functionality as the VDatum Tidal API and more. If you have any concerns, please contact us at vdatum.info@noaa.gov
- Understanding how the West Coast Roadmap differs from the normal Roadmap
- Understanding how Chesapeake/Delaware Bay Transformation Roadmap differs from the normal roadmap
- Understanding how SE AK Transformation Roadmap differs from the normal Roadmap.
- Gulf of Maine (identified issue): a transformation error in ME grids for VDatum in the vicinity of Bath ME has been identified. Users should understand there is higher uncertainty (greater than 50 cm) than reported when transforming to tidal datums in the vicinity.
- Transformation Uncertainties in the 'Louisiana/Mississippi - Eastern Louisiana to Mississippi Sound' Regional Model, have been found to range from 20 to 50 cm in particular locations from the Mississippi River Delta north to Lake Pontchartrain. These issues most likely can be attributed to subsidence, newly established datums, and changes to the understanding of NAVD88 based on new versions of the GEOID. The VDatum Team is currently looking at resolving these uncertainties.

Download v4.5.1

Download the latest VDatum **(v4.5.1)** and its datasets.

Revision Log

Click to Subscribe

One-Pager

House Bill 814

"**§ 102-1.2. Name and description in relation to the North American Terrestrial Reference Frame of 2022.**

From and after the date and time the North Carolina Geodetic Survey Section in the Division of Emergency Management of the Department of Public Safety receives from the National Oceanic and Atmospheric Administration's National Geodetic Survey (NGS) official notice of a complete, published definition of the North American Terrestrial Reference Frame of 2022 (NATRF2022), including the State plane coordinate constants applicable to North Carolina, the official survey base for North Carolina shall be a system of plane coordinates to be known as the "North Carolina Coordinate System of 2022," said system being defined as a one-parallel Lambert conformal conic projection of the "Geodetic Reference System (GRS 80) ellipsoid" having a central meridian of 79° – 00' west from the prime meridian and a central parallel of latitude of 35° – 15' north of the equator, along which parallel the scale shall be exactly 0.999 96 or 1 part in 25,000 smaller than unity. All coordinates of the system are expressed in meters, the east or x coordinate being measured easterly along the grid and the north or y coordinate being measured northerly along the grid. The International Foot, 1 foot = 0.3048 meter exactly, shall be used as a conversion factor. The origin of the coordinates is hereby established at the intersection of the central meridian and the central parallel, such origin being given the coordinates of east or x = 1,000,000 meters and north or y = 200,000 meters. The precise position of said system shall be as marked on the ground by geodetic monuments and Continuously Operating Reference Stations (CORSs) established in conformity with the standards adopted by NGS, whose geodetic positions have been adjusted on NATRF2022, and whose plane coordinates have been computed on the system defined. Whenever plane coordinates are used in the description or identification of surface area or location within this State, the coordinates shall be identified as "NATRF2022," indicating North American Terrestrial Reference Frame of 2022, or as "NAD 83," indicating North American Datum of 1983, or as "NAD 27," indicating North American Datum of 1927."

House Bill 814

"**§ 102-1.3. Name and description of future horizontal and vertical reference frames.**

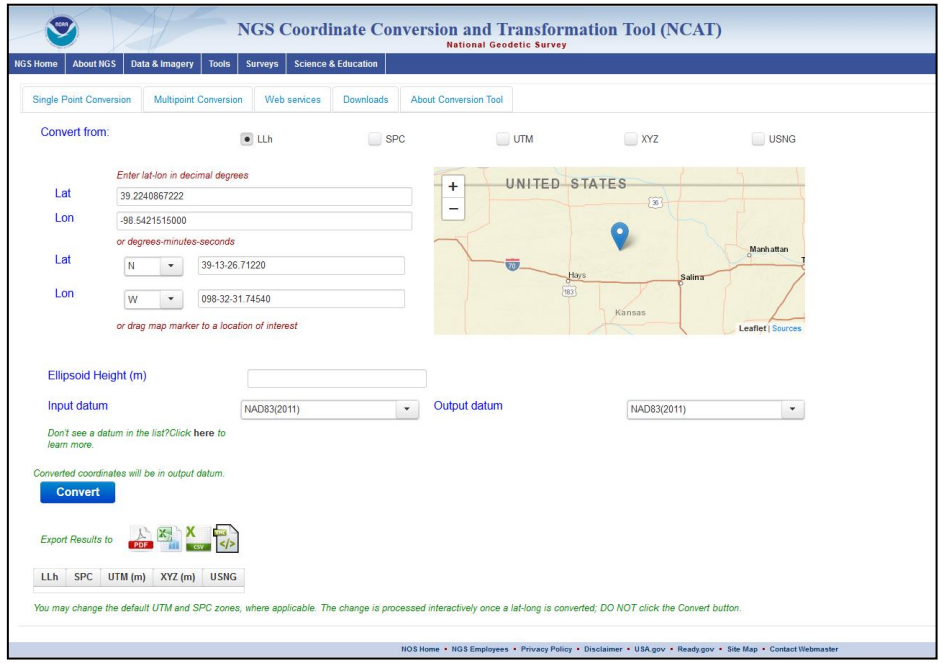
From and after the date and time that the North Carolina Geodetic Survey Section in the Division of Emergency Management of the Department of Public Safety receives an official notice from the National Geodetic Survey of a change or adjustment to NATRF2022 or any other part of the National Spatial Reference System (NSRS), the North Carolina Geodetic Survey will have the authority, as described in G.S. 102-9, to adopt rules, regulations, and specifications on the official use or characteristics of any future horizontal or vertical reference frames and associated coordinate systems of the NSRS."

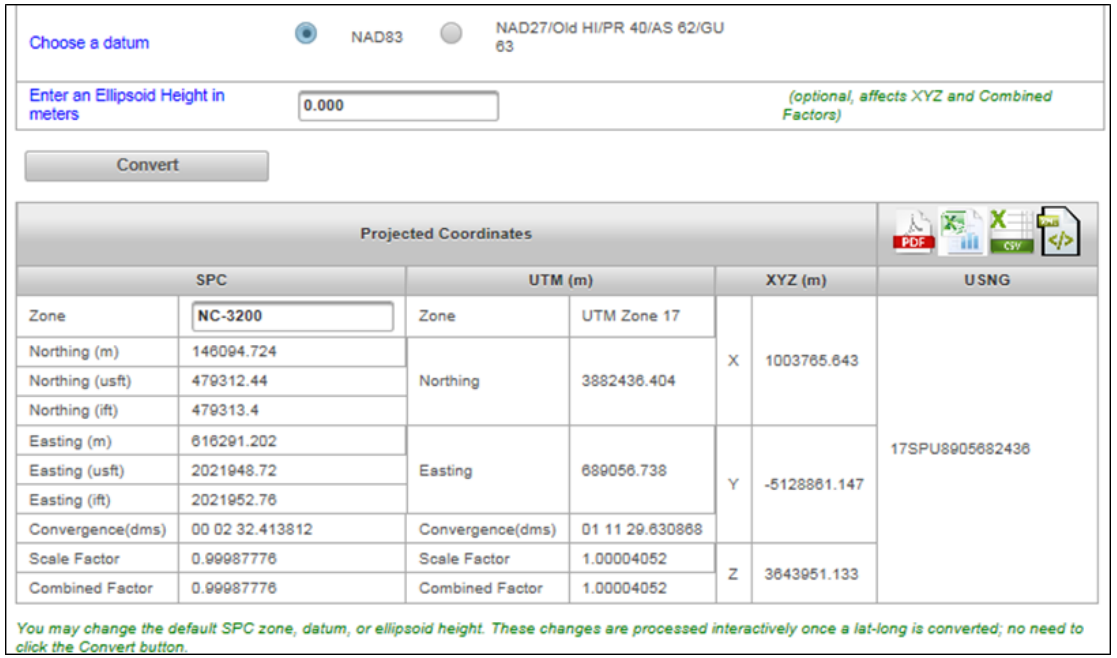
SECTION 2.(d) G.S. 102-11 reads as rewritten:

"**§ 102-11. Vertical control.**

Whereas the foregoing provisions of this Chapter heretofore are related to horizontal control only, the administrative agency may adopt standards for vertical control or levying surveys consistent with those recommended by and used by the United States ~~Coast and~~ National Geodetic Survey, and make or cause to be made such surveys as are necessary to complete the vertical control of North Carolina, in accordance with the provisions for horizontal control surveys as defined in this Chapter. The administrative agency shall have the authority to determine the official vertical datum used in this State."

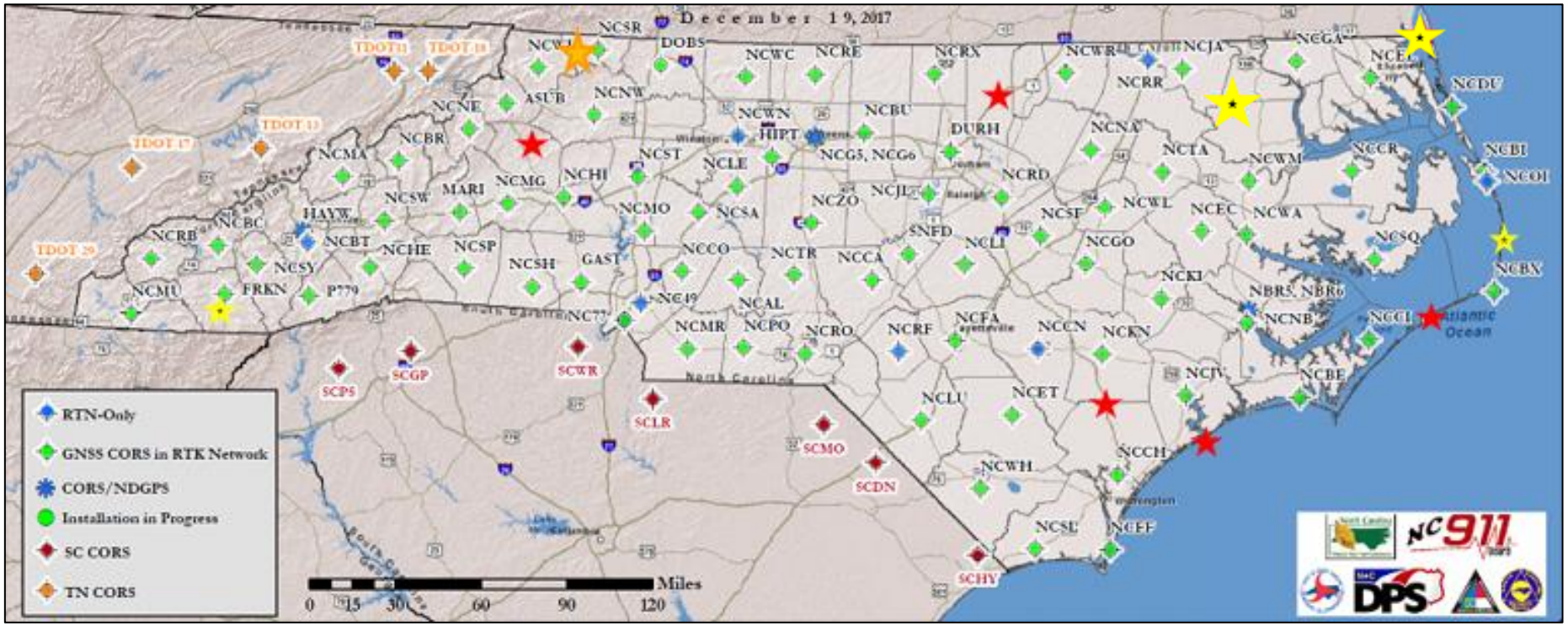
National Geodetic Survey Coordinate Conversion Tool





https://www.ngs.noaa.gov/NCAT/

North Carolina (NC) Continuously Operating Reference Station (CORS) Network



Future CORS location = ★
CORS installed = ★
Earthquake CORS = ★

New CORS to replace Franklin (FRKN) CORS

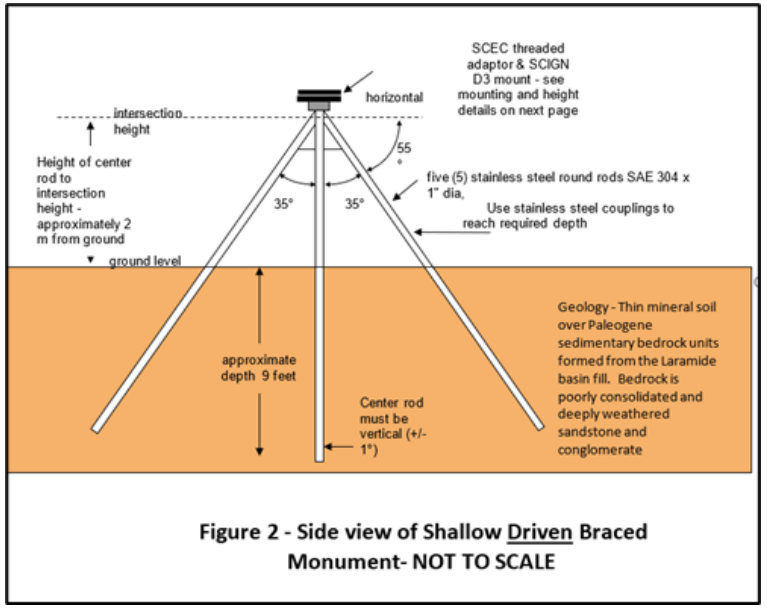


Figure 2 - Side view of Shallow Driven Braced Monument- NOT TO SCALE

SCEC = Southern California Earthquake Center
SAE = SAE International

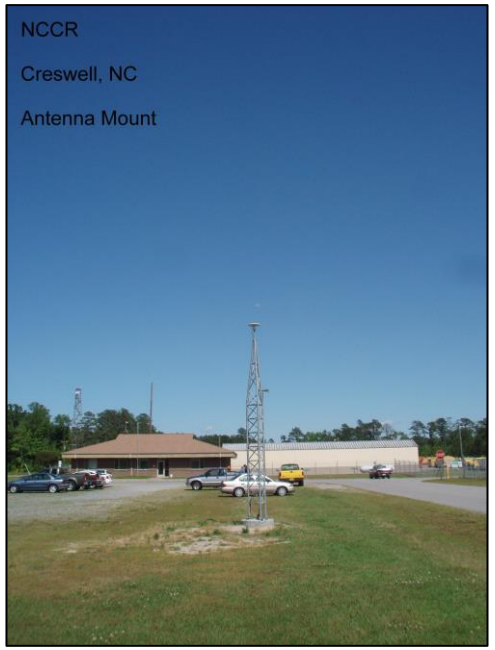
NC CORS Network

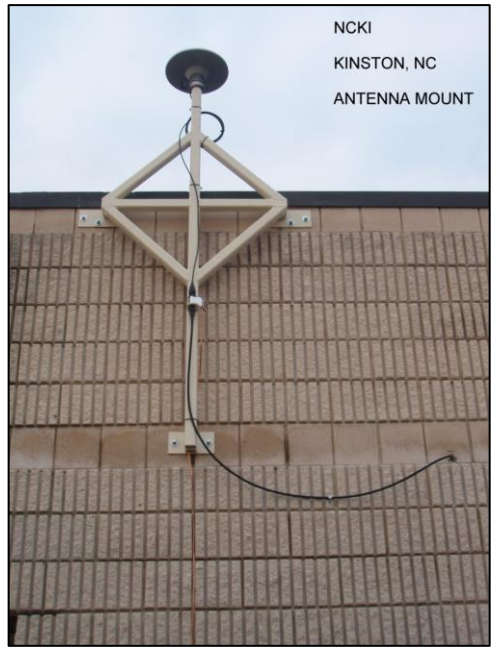
- CORS upgraded in 2023 (funding provided by the 911 Wireless Board)
  - Creswell (NCCR)
  - Knotts Island (NCKT)
  - Rodanthe (NCRT)
  - Jacksonville (NCJV)
  - Swanquarter (NCSO)
  - Oregon Inlet (NCOI)

Twenty-nine (29) sites are being upgraded using funds included in the 2023-2024 state budget

Funding provided by a Tobacco Trust Fund grant has been used to:
Upgrade the CORS equipment at the following CORS:

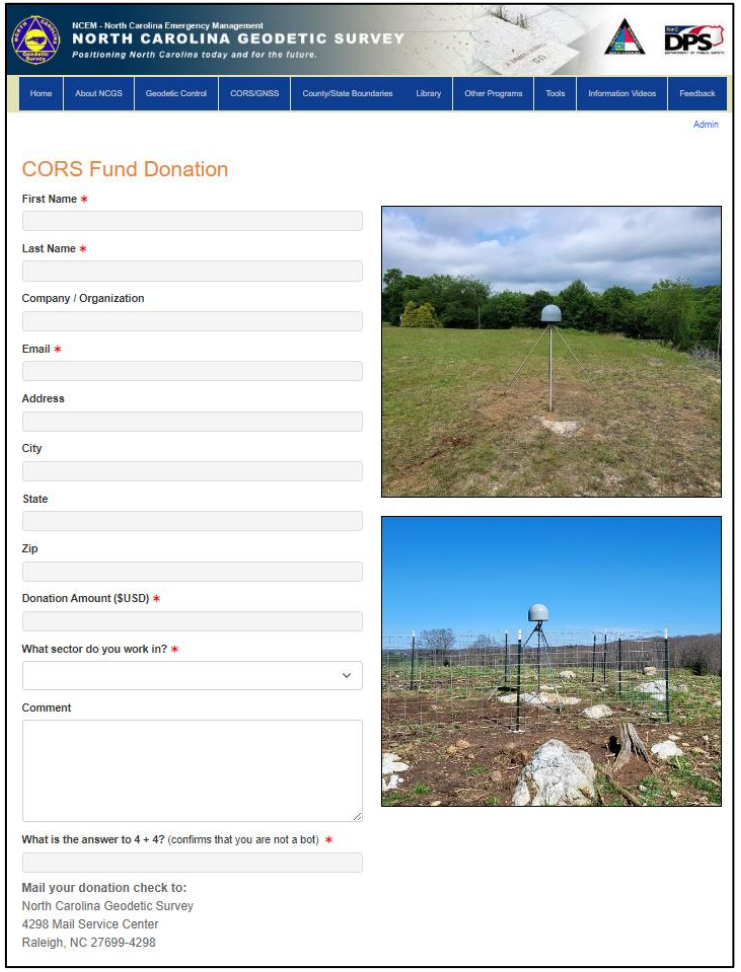
- Kinston (NCKI)
- Winston Salem (NCWN)
- Install a new CORS in Bertie County

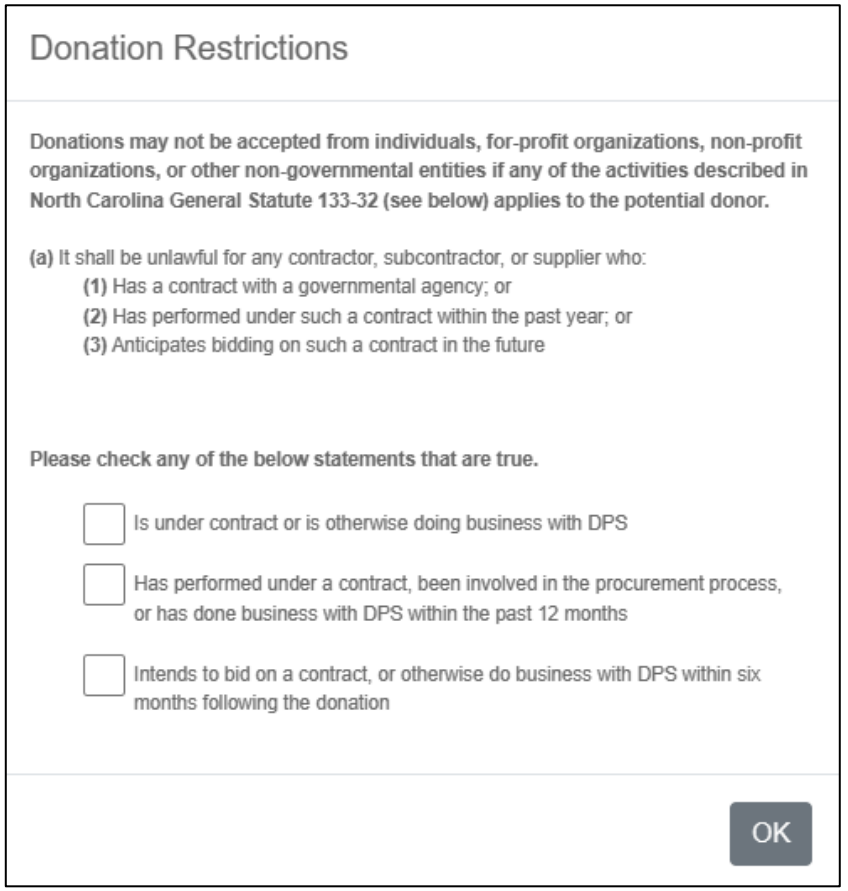




These three (3) funding sources will provide the funds to replace NETR5s and R9s in the network

CORS Fund





https://ncgs.state.nc.us/Donate_CORS

North Carolina Geodetic Survey (NCGS): Positioning NC today and for the future!

State and County Boundary Surveys

County Boundary Surveys in Progress

Projects in progress

- Jackson – Macon (establishing county boundary monuments in progress)
- McDowell-Mitchell (plats recorded)
- Catawba – Lincoln (report and preliminary plat provided to the counties)
- Granville – Franklin (HB438 ratified)
- Mecklenburg – Union (HB457)
- Forsyth-Guilford (field work in progress)
- Polk – Rutherford
- Chowan – Perquimans
- Harnett – Johnston
- Burke-McDowell
- Beaufort-Pitt
- Caldwell - Watauga
- Mitchell – Yancey
- Cumberland - Harnett
- Bladen – Columbus – Brunswick
- Buncombe - Henderson

North Carolina General Statutes

§ 153A-17. Existing boundaries.
The boundaries of each county shall remain as presently established, until changed in accordance with law. (1973, c. 822, s. 1.)

§ 153A-18. Uncertain or disputed boundary.

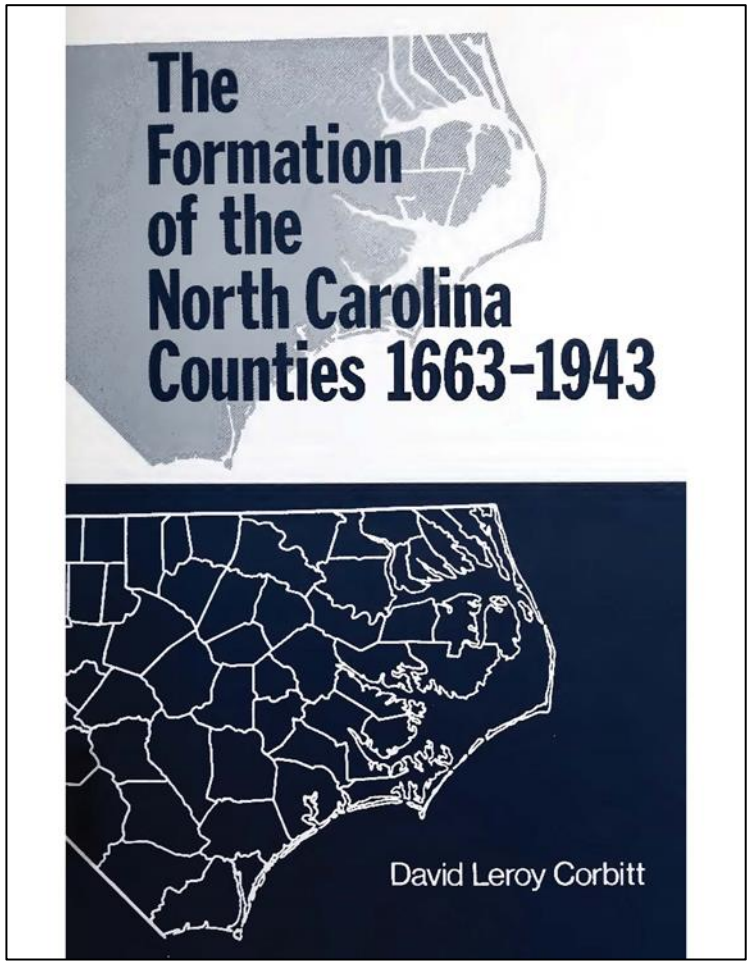
153A-18 (a) Process

- Requires a written request from all the adjacent counties
- Counties may appoint a special commissioner to supervise the work
  - Commissioner
  - County staff
- Research and field surveys performed
  - Request assistance (county staff)
- Preliminary information (plat) will be provided to the counties for review
- NCGS will attend public meetings or commissioners' meetings if requested
- Final report and plat(s) provided to counties

153A-18 (a) Process

- Counties approve plats (resolution)
- Plats are recorded in the counties Register of Deeds office
  - A copy of the plat is recorded in the Secretary of States office
- One year after NCGS submits the results of the survey to the requesting counties and the counties have not ratified the reestablished boundary the survey plat will be:
  - Conclusive as to the location of the county boundary
  - Recorded in the Register of Deeds in each affected county by NCGS
  - Submitted to the Secretary of State's office by NCGS
- Affected parties will be notified in writing of the action taken

Legal Description of North Carolina County Boundaries



State Boundaries

- North Carolina – Tennessee
  - Received a request to confirm the location of the North Carolina – Tennessee boundary (Watauga County)

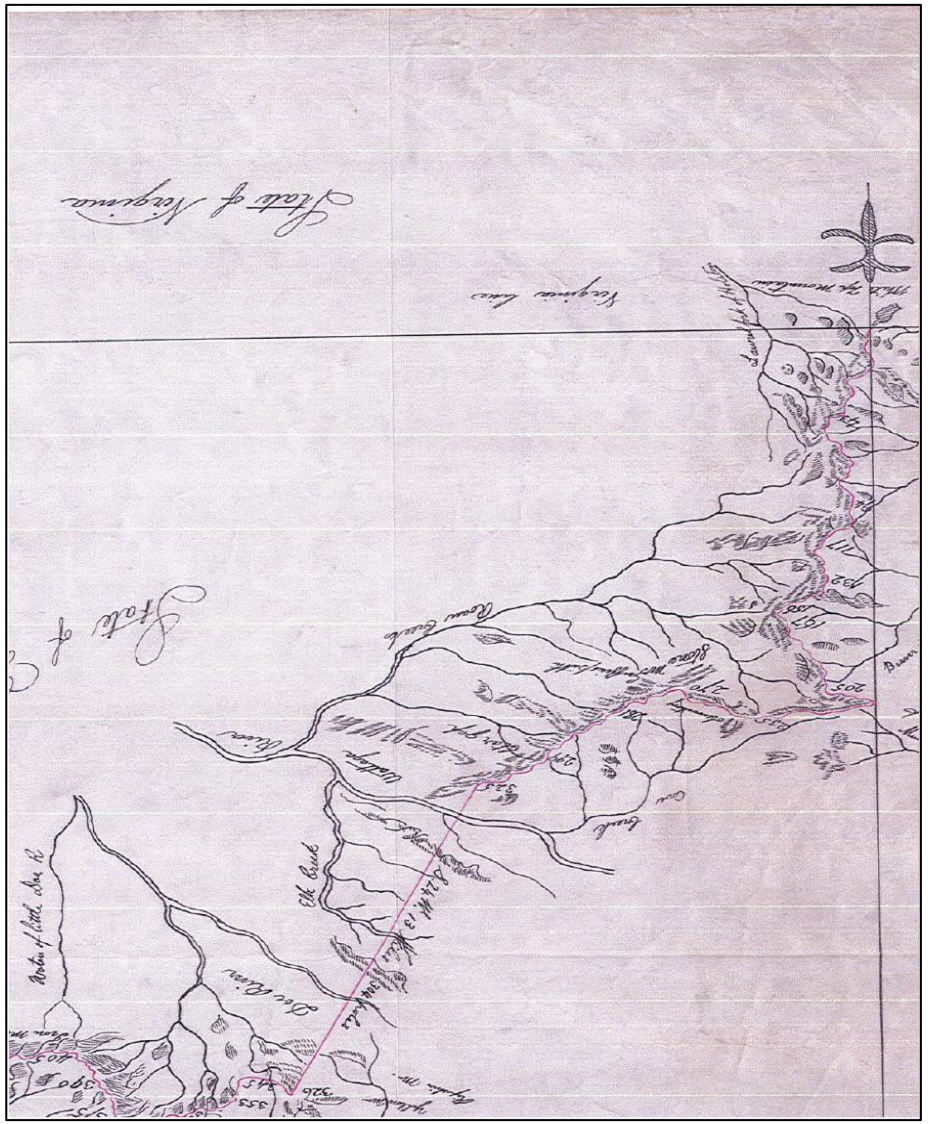
Establishing a North Carolina – Tennessee Boundary Commission

North Carolina (NC)/Tennessee (TN) boundary history

- NC ceded her western territory to the US in 1789
- 1799 survey led by McDowell, Matthews, & Vance of NC
  - Began at the terminus of the NC-Virginia survey of 1749
  - Follows the ridge lines of 3 different mountain chains
  - Changes from one mountain ridge to the other by straight lines along Avery, Yancey, & Haywood counties.
  - Although the original intent of this line was to run along these ridgelines to the 35th latitude, the surveying team came off the ridge line for some unknown reason at a point boarding present-day Cherokee County and then proceeded south to the Georgia line. (see original survey next slide)

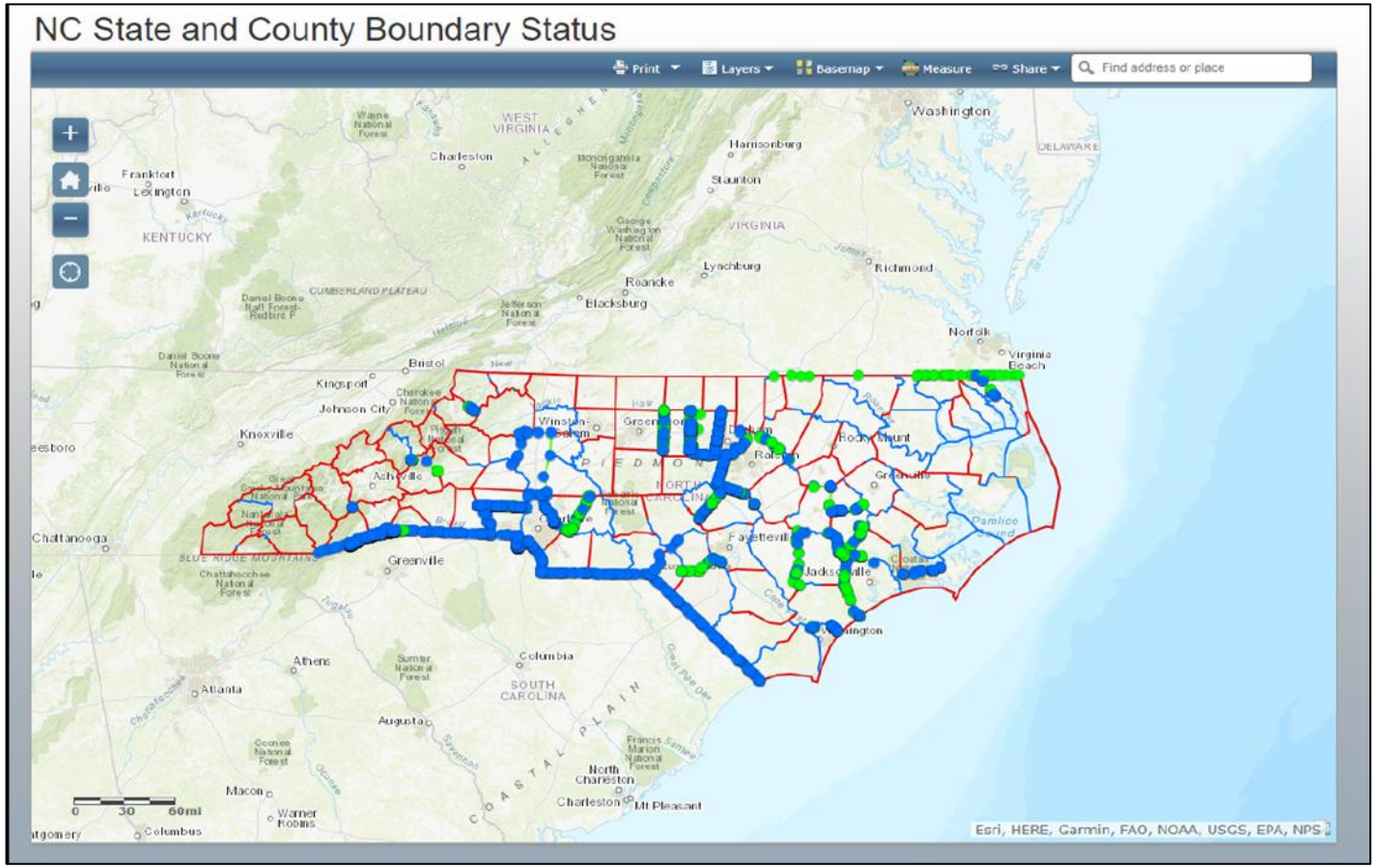
General Statute Governing State Boundary - NC GS 141 Sections 1-9

- Section 1 - Governor's Authority to Establish Boundary and Commissions
- Section 3 - Appointment of Arbitrators
- Section 5 - Approval of Survey
- Section 9 - Re-establishment of NC-SC Border


State of Virginia
Virginia Line
Elk Creek
Deer Run

County/State Boundary Status

http://ncemgis.maps.arcgis.com/apps/OnePane/basicviewer/index.html?appid=523dc3d6b7424a20afbae7b7c1b99d33

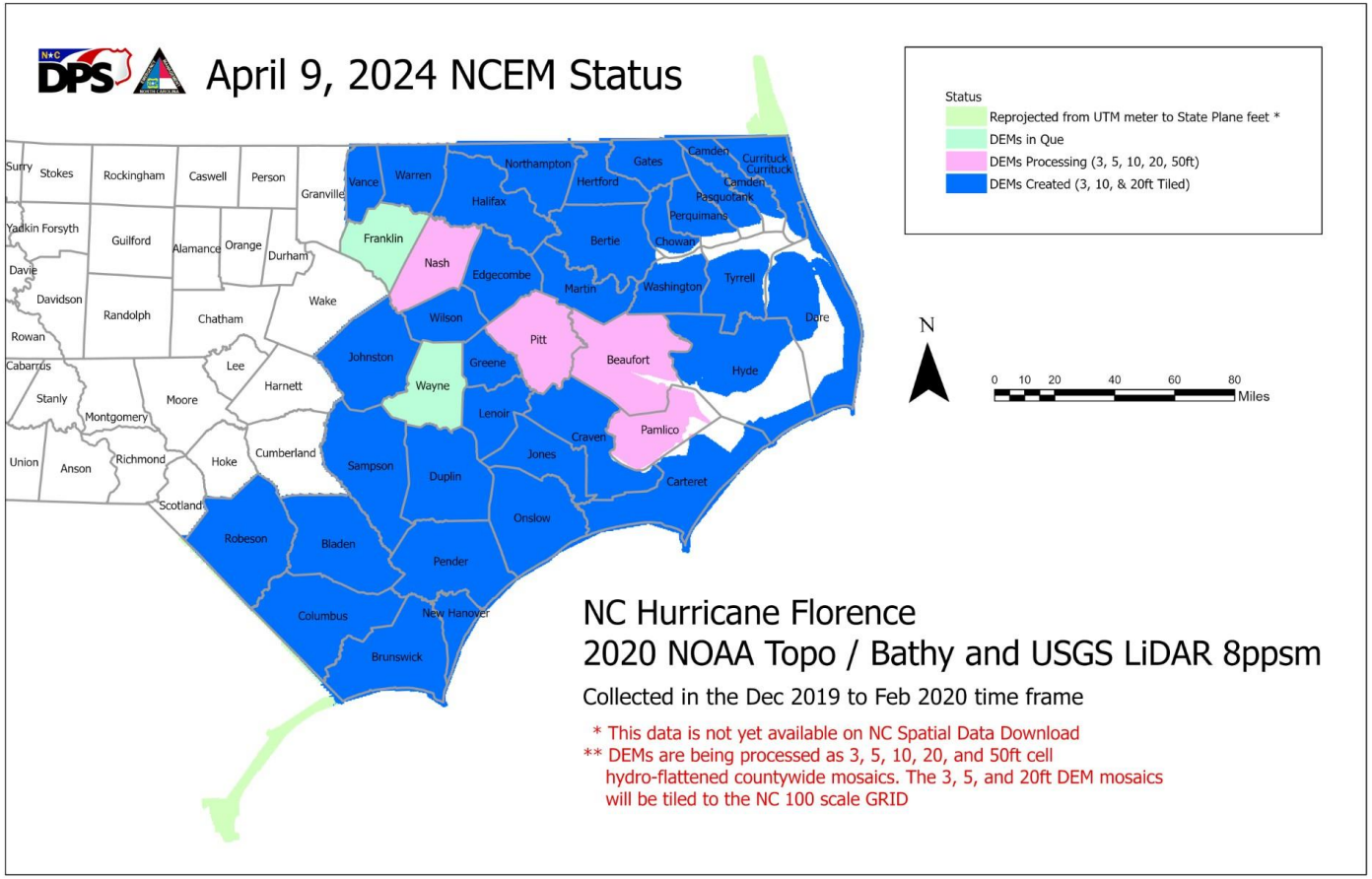


County/State Boundary Status

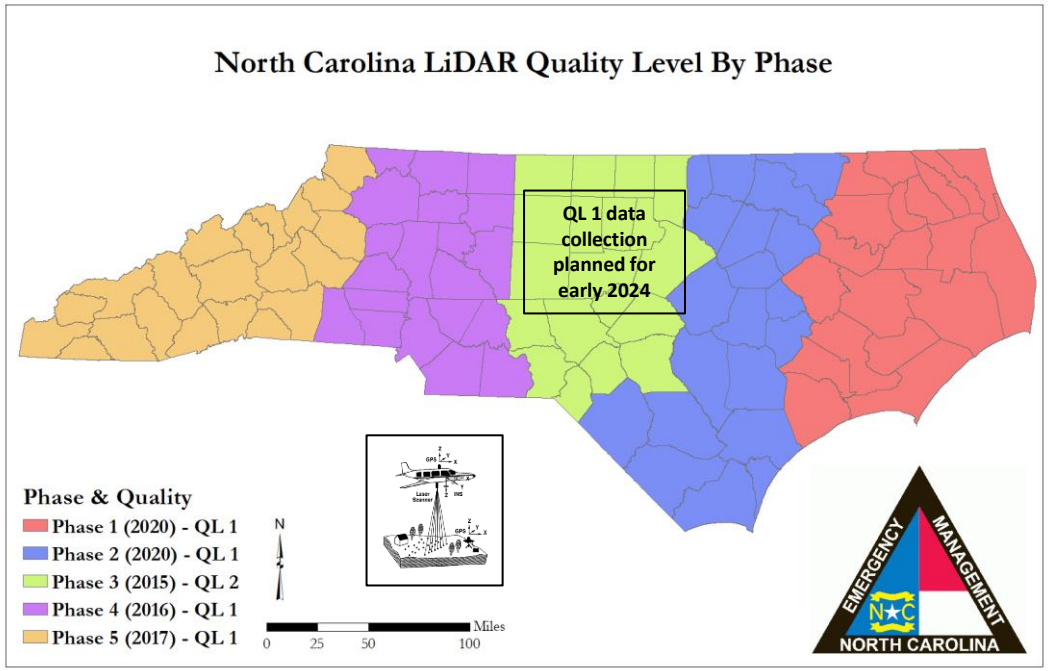
http://www.ncgs.state.nc.us/Documents/status_county_lines.pdf

Updated 02/03/2022			
Map title	**Public records and NCGS files**	**Map book and NCGS information**	**File date**
Alamance - Orange	Alamance	PB 74,pg 292-315 & 445-450;PB 75,pg 167-177	May 6,2011 & Oct.14,2011
	Orange	PB 109,pg 67-90;PB 110,pg 52-62	June 6,2012
Anson - Union	NCGS file		
Ashe - Watauga	Ashe	Book 5,pg.245	March,1991
	Watauga	Book 12,pg.25	March,1991
Beaufort - Craven	NCGS file		
Beaufort - Martin - Washington	Beaufort	PC F,SL 29,2-3	August 25, 1998
	Martin	Board of Commisioners approved 1/17/1996	
	Washington	PC 2, pg 153	August 10, 1998
Bladen - Columbus	NCGS file	In process	
Brunswick - Columbus	NCGS file	In process	
Buncombe - Henderson (partial)	Buncombe	DB 1729, Pg. 320	December 12, 1992
	Buncombe	Plat Bk 1; pg. 238	June 2, 1993
	Henderson	Deed Book 821, Pg. 481	December 12, 1992
Burke - McDowell (partial)	Burke	Plat Book 29, pg. 297-298	January 17, 2006
	McDowell		
Cabarrus - Mecklenburg	Mecklenburg	MB 39, pg. 199 & 201	March 10, 2003
	Cabarrus	MB 41, pg. 82-83	March 4, 2003
Cabarrus - Rowan	NCGS file	Under review by Counties	
Cabarrus - Stanly	Cabarrus	Plat Bk. 66,pg. 26-29	June 4,2013
	Stanly	Plat Bk. 23,pg.290-293	June 4,2013
Cabarrus - Union	Cabarrus	Plat Bk. 59,pg.85	December 1,2010
	Union	Plat Slide 0000L-0328	December 1,2010
Camden - Currituck	Currituck	Cab J, slides 184-186	10-May-01
Carteret - Craven	Carteret	Recorded in CCR MB 28, pg 665	September 8, 1994
	Craven	Session Law 1998-49 HB 1611	
Caswell - Person	NCGS file		
Caswell - Rockingham	NCGS file		

2020 United States Geological Survey LiDAR



NC Light Detection and Ranging (LiDAR) Elevation Data



Data collection has been completed in Phase 3

QL = Quality Level

- **Project Timeline:**
  LiDAR data collection will be performed during leaf-off conditions (January – March). The estimated delivery dates for the processing and classification and all products would proceed as follows (Table 5):

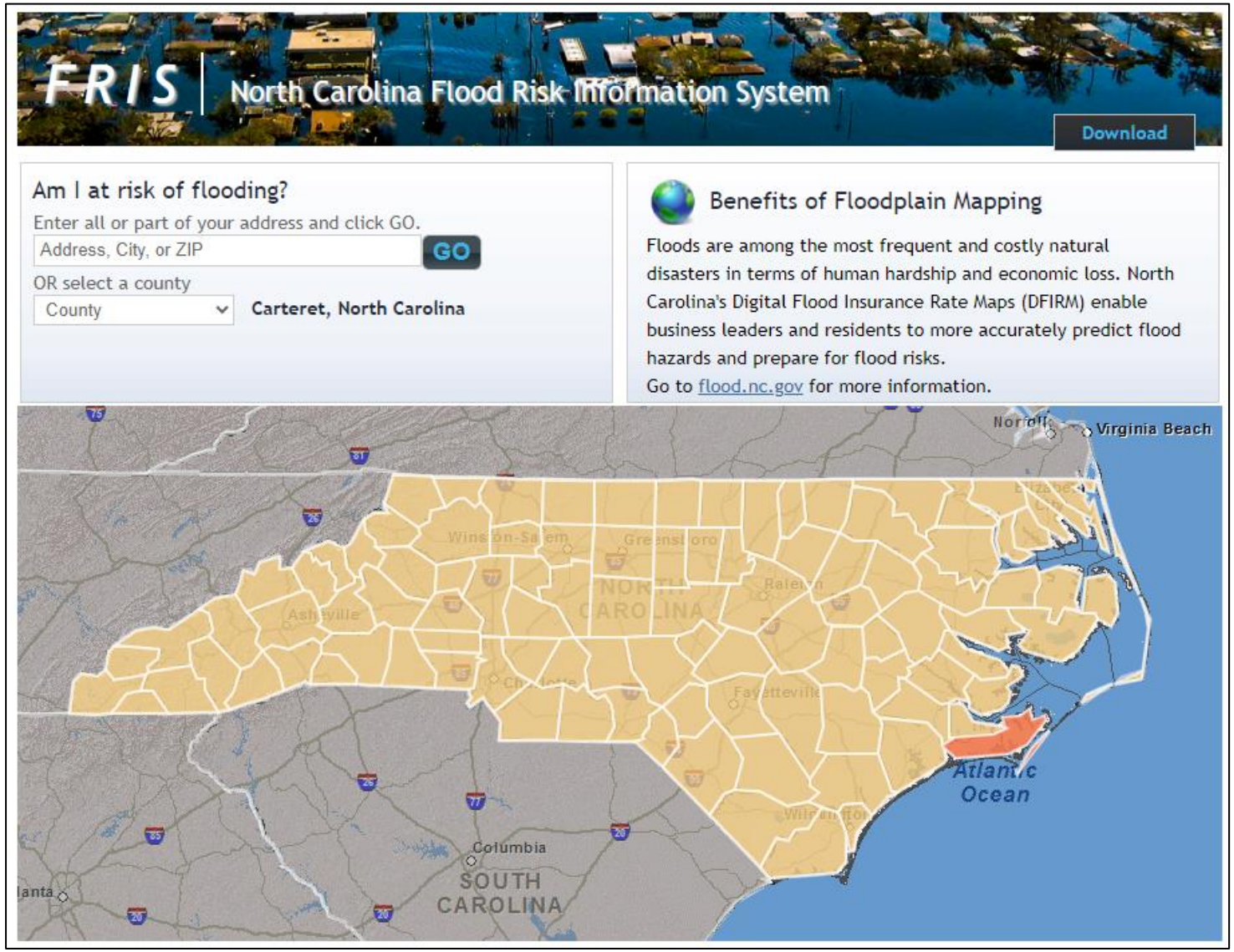
Table 5. The estimated delivery dates for the processing and classification and all products and

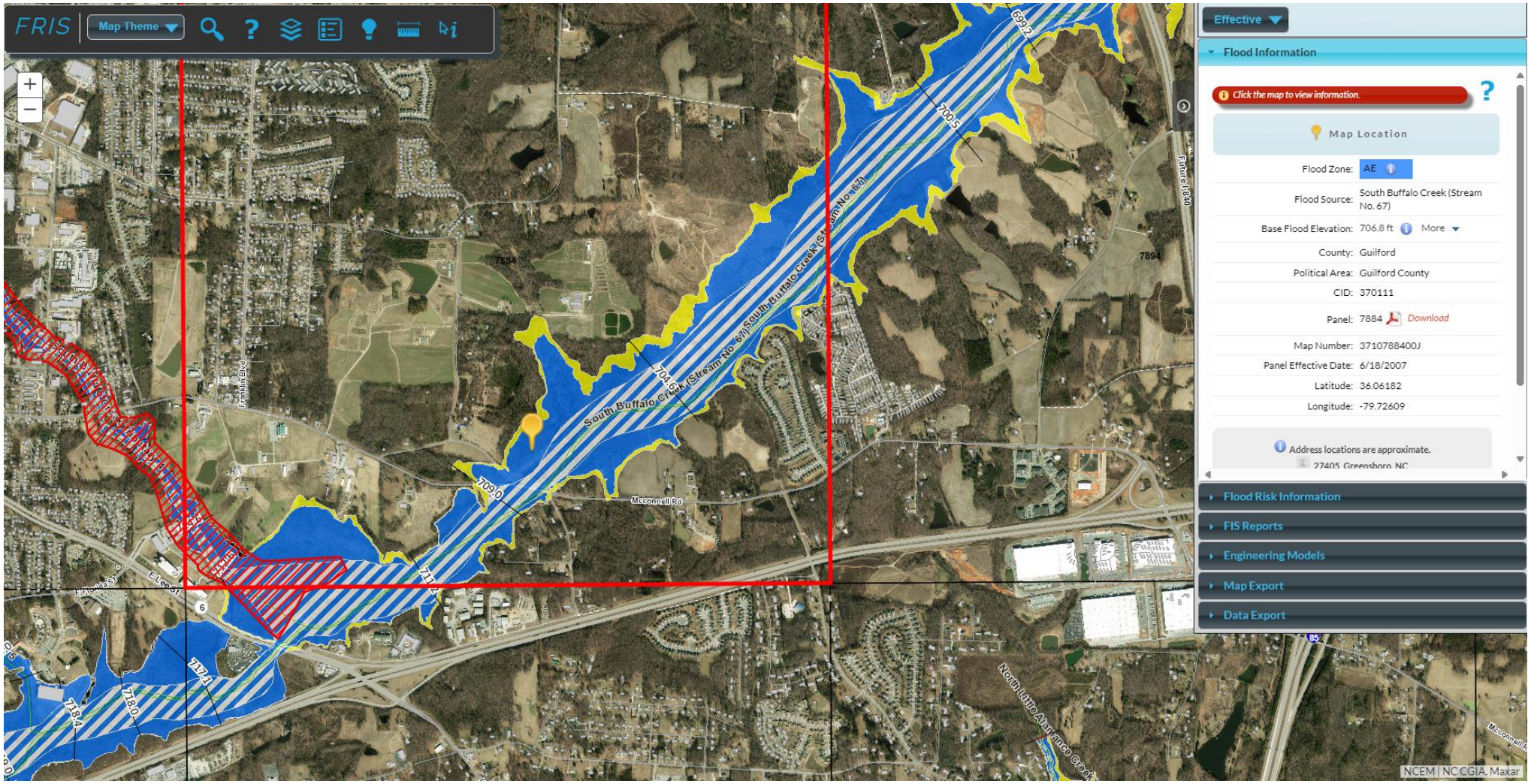
	Delivery dates	
When the Acquisition phase is actually conducted	**Processing calibration and classification would be delivered on an incremental schedule until the beginning of:**	**All products and deliverables should be available by beginning of:**
January-March	November -December of the same year as data acquisition	February (of the following year of acquisition)

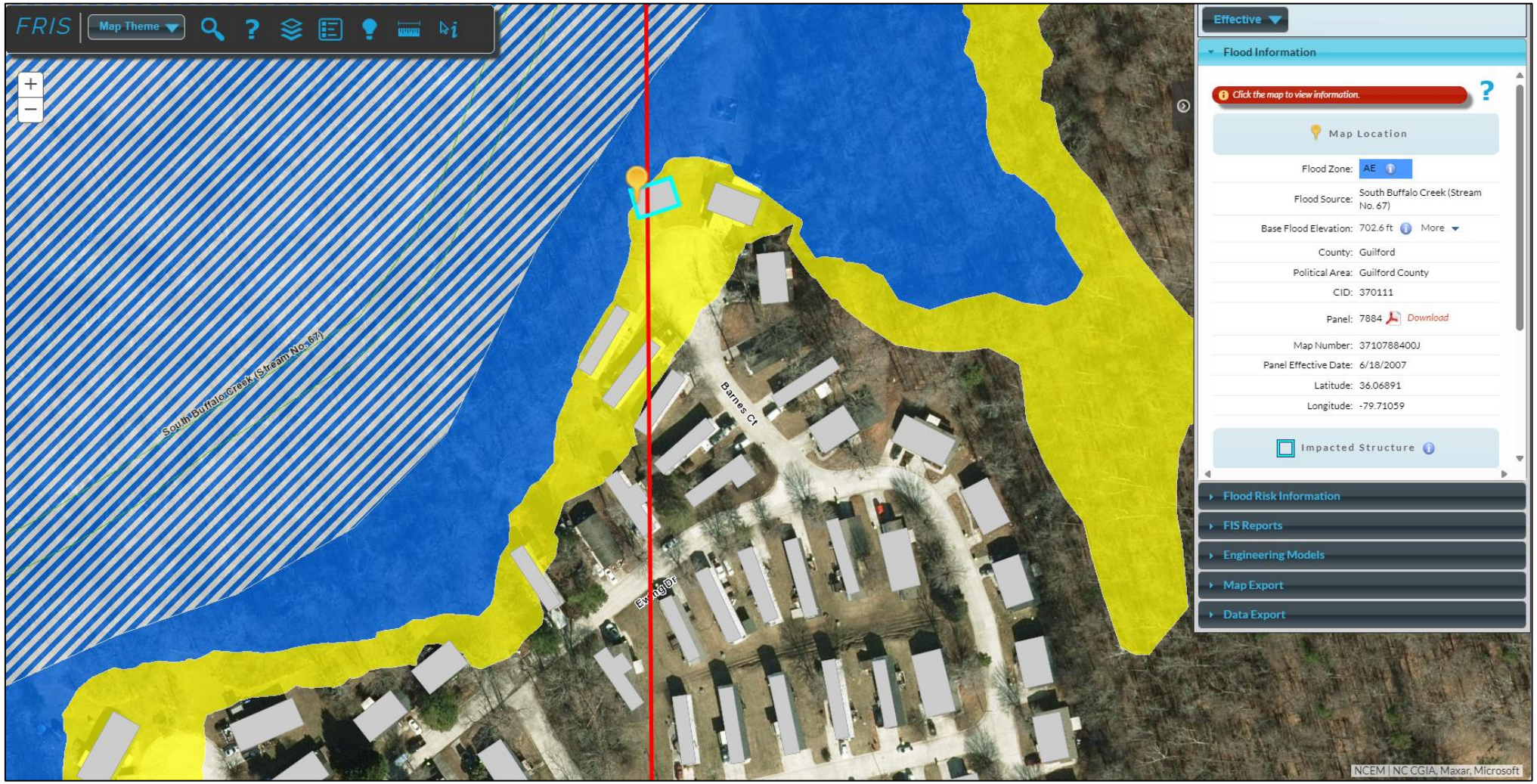
Note: Quality control would be performed with all deliverables.

Applications Updates

- Flood Risk Information System (FRIS)
- Spatial Data Download (SDD)
- Flood Inundation Mapping and Alert Network (FIMAN)


FRIS
North Carolina Flood Risk Information System
Download
Am I at risk of flooding?
Enter all or part of your address and click GO.
Address, City, or ZIP
GO
OR select a county
County
Carteret, North Carolina
Benefits of Floodplain Mapping
Floods are among the most frequent and costly natural disasters in terms of human hardship and economic loss. North Carolina's Digital Flood Insurance Rate Maps (DFIRM) enable business leaders and residents to more accurately predict flood hazards and prepare for flood risks.
Go to flood.nc.gov for more information.
Norfolk
Virginia Beach
Winston-Salem
Greensboro
Raleigh
Asheville
Fayetteville
Atlantic Ocean
Columbia
SOUTH CAROLINA


FRIS
Map Theme
Effective
Flood Information
Click the map to view information.
Map Location
Flood Zone: AE
Flood Source: South Buffalo Creek (Stream No. 67)
Base Flood Elevation: 706.8 ft More
County: Guilford
Political Area: Guilford County
CID: 370111
Panel: 7884 Download
Map Number: 3710788400J
Panel Effective Date: 6/18/2007
Latitude: 36.06182
Longitude: -79.72609
Address locations are approximate.
27405 Greensboro, NC
Flood Risk Information
FIS Reports
Engineering Models
Map Export
Data Export
South Buffalo Creek (Stream No. 67)
Mcconnell Rd
Franklin Blvd
NCEM | NC CGIA, Maxar


FRIS
Map Theme
South Buffalo Creek (Stream No. 67)
Barnes Ct
Effective
Flood Information
Click the map to view information.
Map Location
Flood Zone: AE
Flood Source: South Buffalo Creek (Stream No. 67)
Base Flood Elevation: 702.6 ft More
County: Guilford
Political Area: Guilford County
CID: 370111
Panel: 7884 Download
Map Number: 3710788400J
Panel Effective Date: 6/18/2007
Latitude: 36.06891
Longitude: -79.71059
Impacted Structure
Flood Risk Information
FIS Reports
Engineering Models
Map Export
Data Export
NCEM | NC CGIA, Maxar, Microsoft

SPATIAL Data Download

WELCOME TO NORTH CAROLINA'S SPATIAL DATA DOWNLOAD

NCID Login | Google Login

Login below with your NCID

Don't have a NCID? Sign up here.

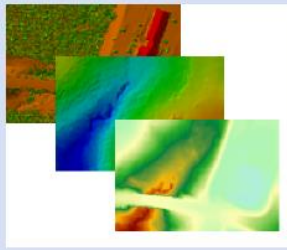
NCID USER NAME:

PASSWORD:

LOGIN

Hazards

Information provided with Floodplain Mapping.



Elevation Data

- Quality Level 1 & 2 LiDAR (2014-2017)
- Legacy LiDAR (2001-2005)
- Digital Elevation Models
- DEM Mosaics by County 3.125, 5, 10, 20 and 50 foot cell size

Building Footprints

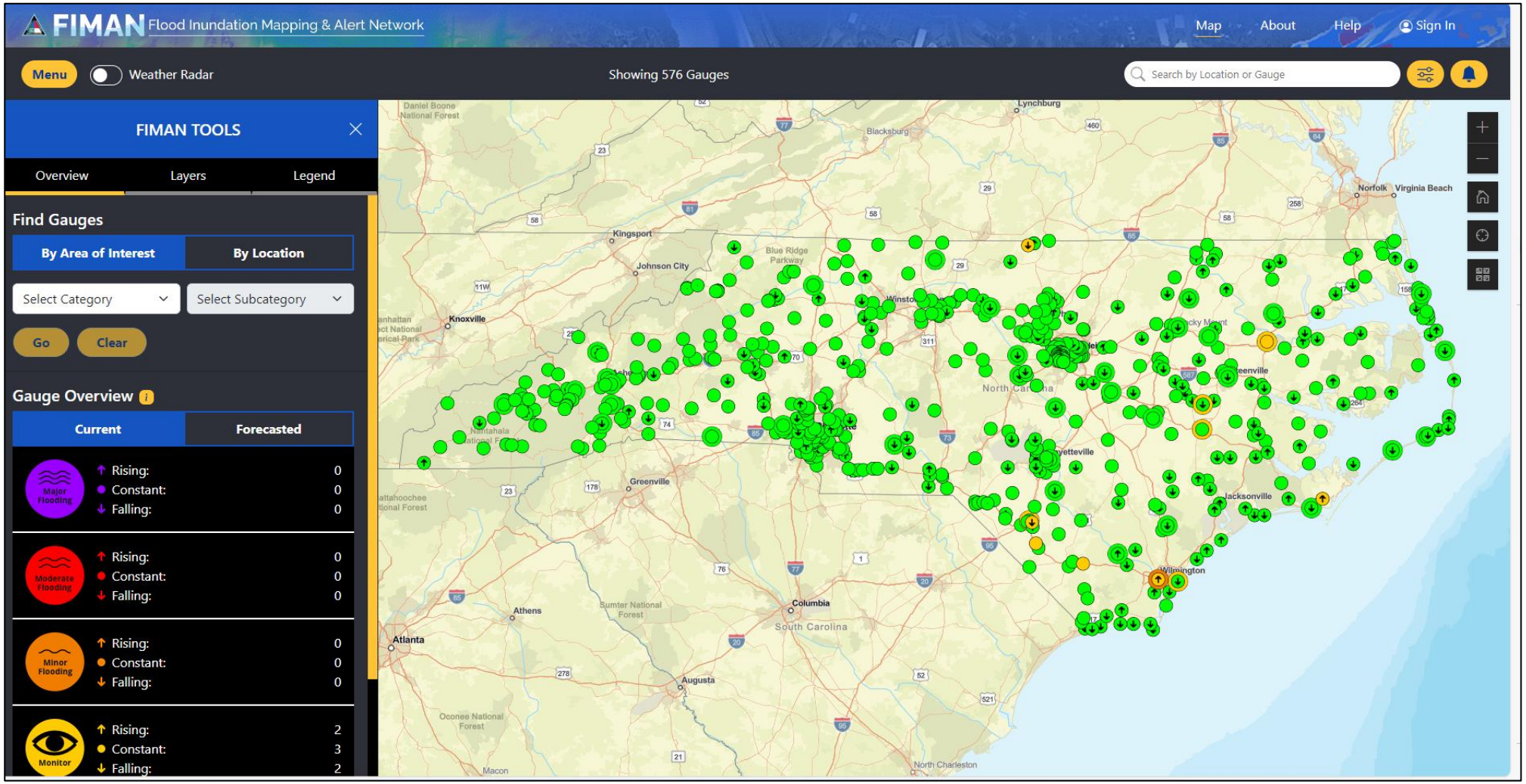
2010 Statewide Building Footprint Polygons by county

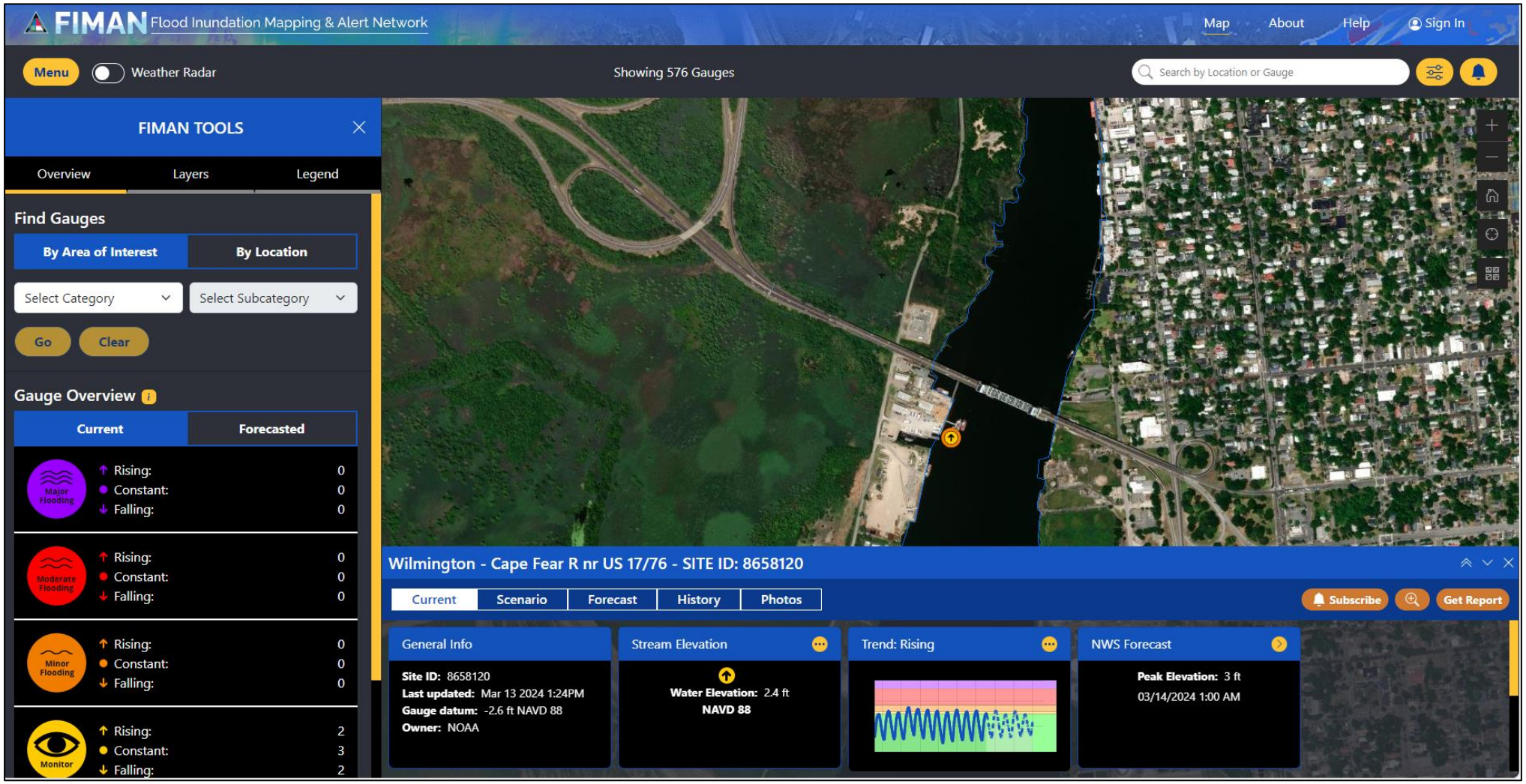
2020 Coastal Building Footprint Polygons by county

2021 Eastern Piedmont Building Footprint Polygons by county

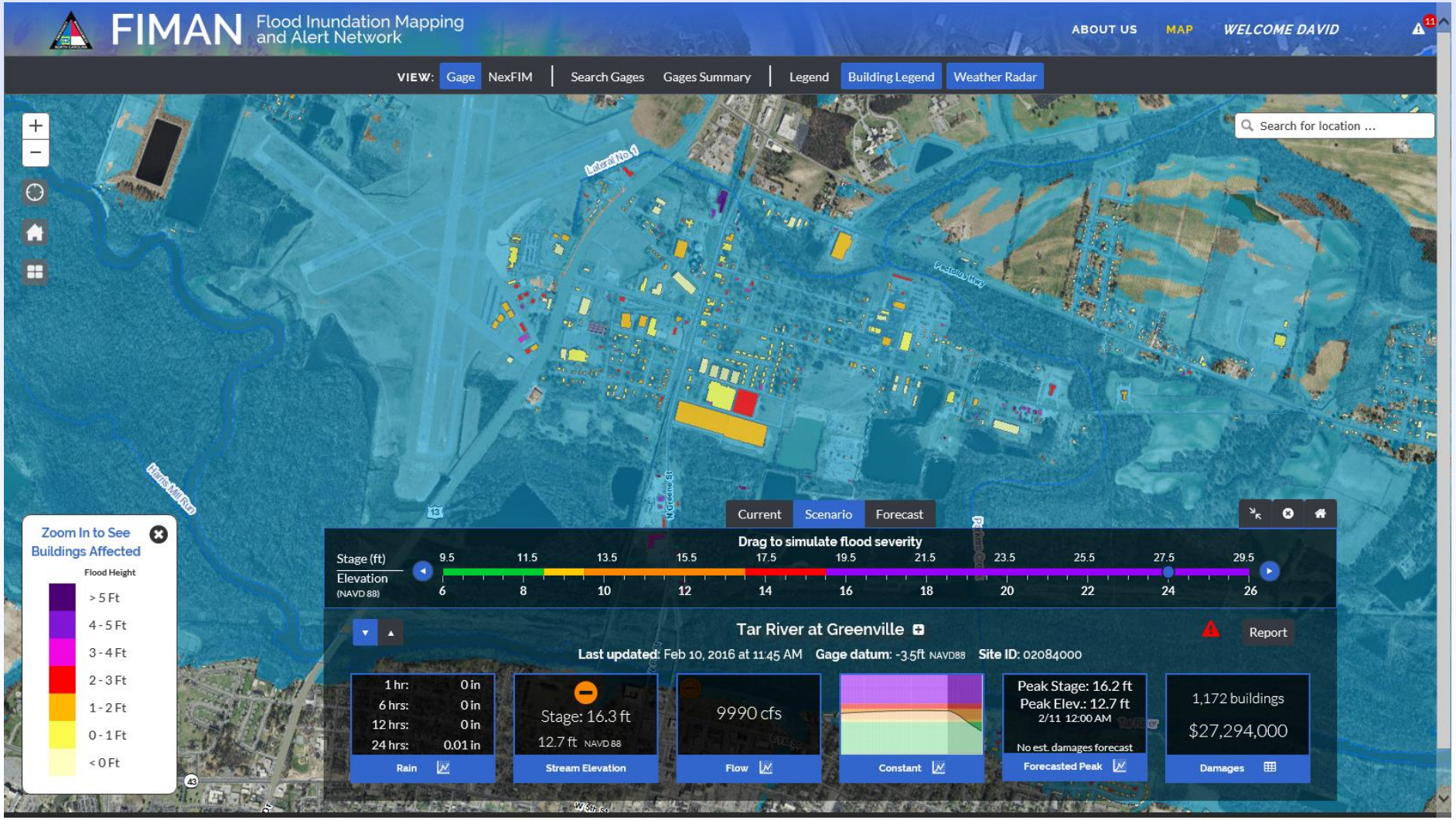
FIMAN Real-time flood mapping solution

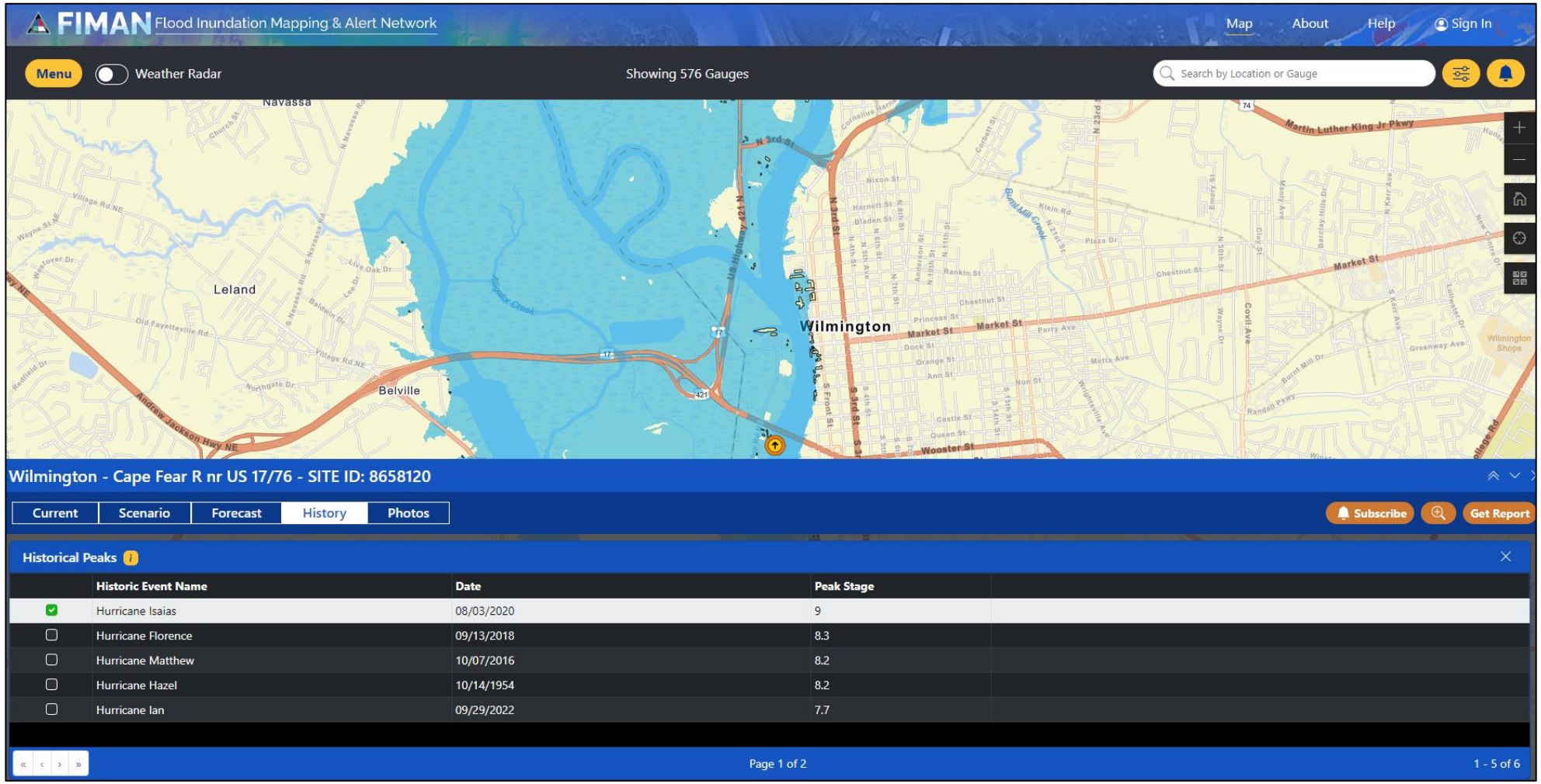
- Gauges
  - 652 gauges in FIMAN
  - NC Emergency Management owned water level and rain gauges (473)
- Telemetry
- Pre-made inundation libraries
- Web tool to efficiently communicate


FIMAN Flood Inundation Mapping & Alert Network
Map
About
Help
Sign In
Menu
Weather Radar
Showing 576 Gauges
Search by Location or Gauge
FIMAN TOOLS
Overview
Layers
Legend
Find Gauges
By Area of Interest
By Location
Select Category
Select Subcategory
Go
Clear
Gauge Overview
Current
Forecasted
Major Flooding
Rising: 0
Constant: 0
Falling: 0
Moderate Flooding
Rising: 0
Constant: 0
Falling: 0
Minor Flooding
Rising: 0
Constant: 0
Falling: 0
Monitor
Rising: 2
Constant: 3
Falling: 2
Knoxville
Kingsport
Johnson City
Blacksburg
Lynchburg
Norfolk
Virginia Beach
Greenville
Columbia
South Carolina
Atlanta
Athens
Augusta
Wilmington
Jacksonville
North Charleston
Macon



Flood Scenario Mode




FIMAN Flood Inundation Mapping & Alert Network
Map
About
Help
Sign In
Menu
Weather Radar
Showing 576 Gauges
Search by Location or Gauge
Navassa
Leland
Belville
Wilmington
Wilmington - Cape Fear R nr US 17/76 - SITE ID: 8658120
Current
Scenario
Forecast
History
Photos
Subscribe
Get Report
Historical Peaks
Historic Event Name
Date
Peak Stage
Hurricane Isaias
08/03/2020
9
Hurricane Florence
09/13/2018
8.3
Hurricane Matthew
10/07/2016
8.2
Hurricane Hazel
10/14/1954
8.2
Hurricane Ian
09/29/2022
7.7
Page 1 of 2
1 - 5 of 6

Adopt a Gauge

Adopt a Gauge

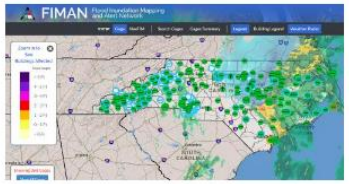
North Carolina's network of more than 500 river, stream and coastal gauges provides data that empowers flood warning for local communities and the public.

Data from these gauges drives the Flood Inundation Mapping and Alert Network (FIMAN) which is designed reduce the loss of life and flood related property damage by providing timely, detailed, and accurate flood inundation information to government officials and the public. For FIMAN to provide timely and accurate information, data from these gauges must be obtained 24 hours a day, seven days a week with no interruptions.

Gauge maintenance is critical to being able to provide continuous data to community officials and the public. North Carolina Emergency Management has created the Adopt a Gauge (AaG) program to partner with local officials to insure that gauges are operational and to notify NCEM when a gauge needs repair.

Submit a gauge report

The Adopt a Gauge program allows a county or local government, nonprofit or civic group to adopt gauges in their community and serve as eyes on the ground for those gauges. Adopt A Gauge partners regularly check the status of their assigned gauge sites, reporting problems (debris buildup, damage, theft) or simply reporting that the gauge is in good condition. While we have online monitoring tools, having eyes in the field can aid in assessing any issues with a gauge.



Visual checks of the gauge site:

- Check to see if there has been any damage or vandalism to the external parts of the gauge (solar panel, antenna, conduits and cabling). Photos can be provided for each site for reference, if needed. Photos are also available in FIMAN for many sites.
- See that the gauge is still an upright position i.e. has not been hit by a vehicle.
- Remove any brush, vines and trees that are within 10 feet of the gauge

Adopt a Gauge - Reporting

Enter observations from your gauge site visits here.

* Indicates required field

First Name *

Last Name

Phone Number *

Email Address *

Date of Inspection *

mm/dd/yyyy

County *

- Select -

Name of Gauge *

Is the gauge in good operating condition? *

- Yes
- No

Submit

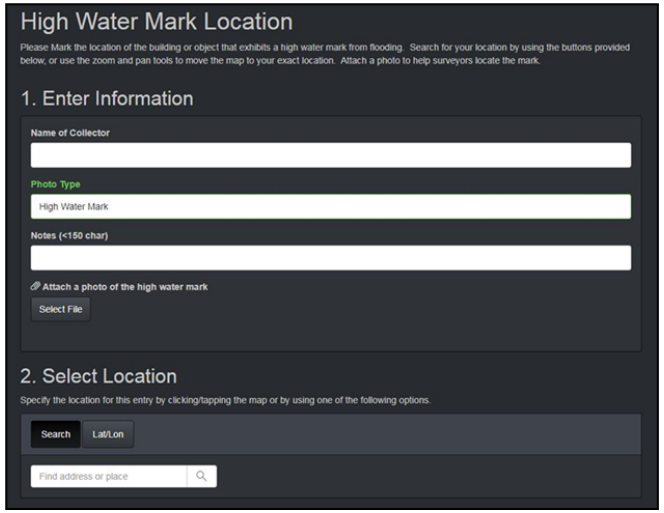
Sevenmile Swamp at SR18094 Gauge

Before

After

Post-Storm Geospatial Data Collection Activities

- High Water Marks
  - Coordinate collection of high water marks
    - NCDOT
    - USGS
    - USACE
    - NC Society of Surveyors
    - Local governments



High Water Mark (HWM) Photo Application

Benefits of a High Water Mark (HWM)

- Are the best resource to document a flood event
- HWM information can be used in a variety of mitigation and planning efforts
- Calibrate models
- Supports FIMAN (Flood Inundation Mapping Alert Network) and FRIS (Flood Risk Information System)
- Supports research activities
- Public safety

HWM Photo

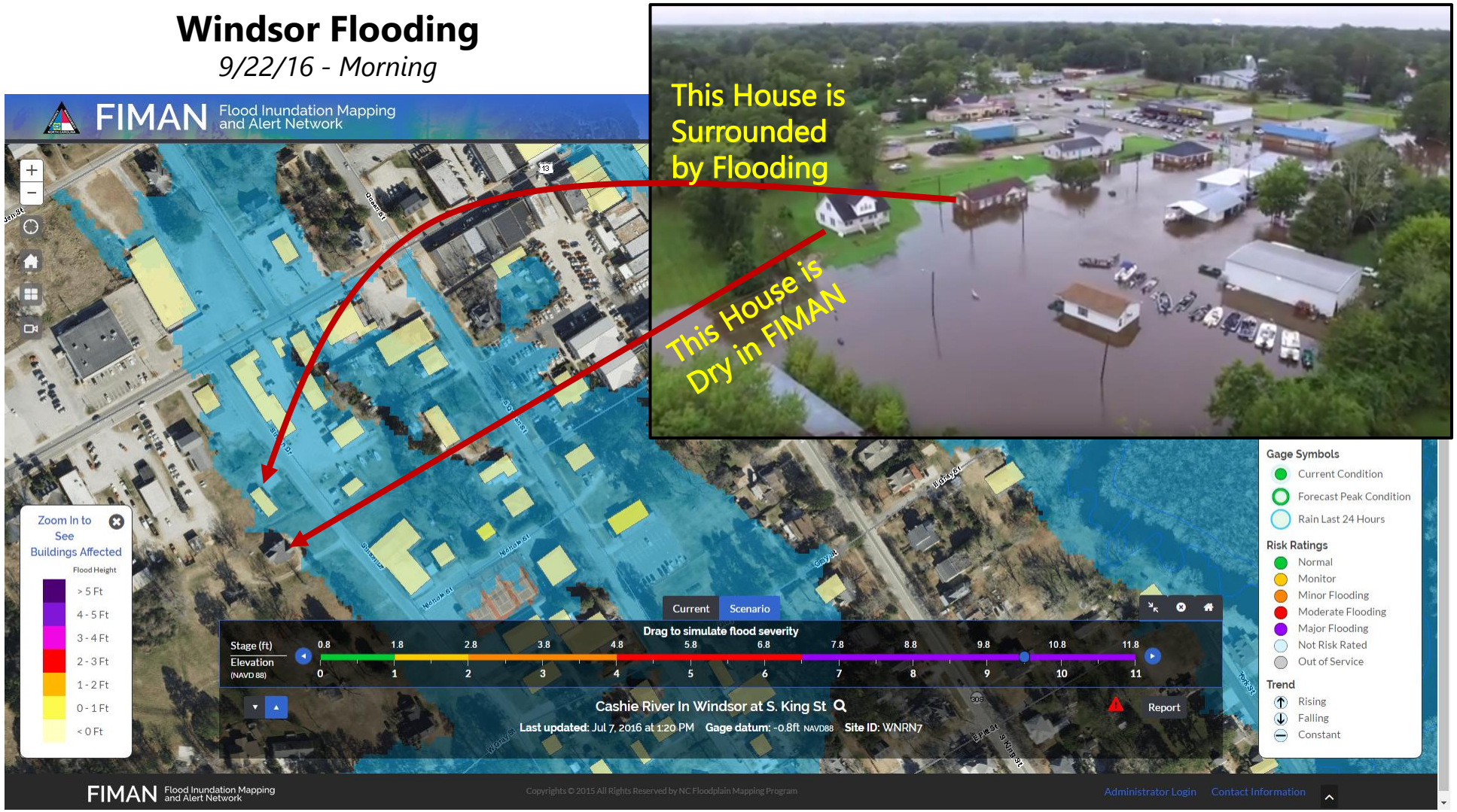
HWM Examples

HWM Examples

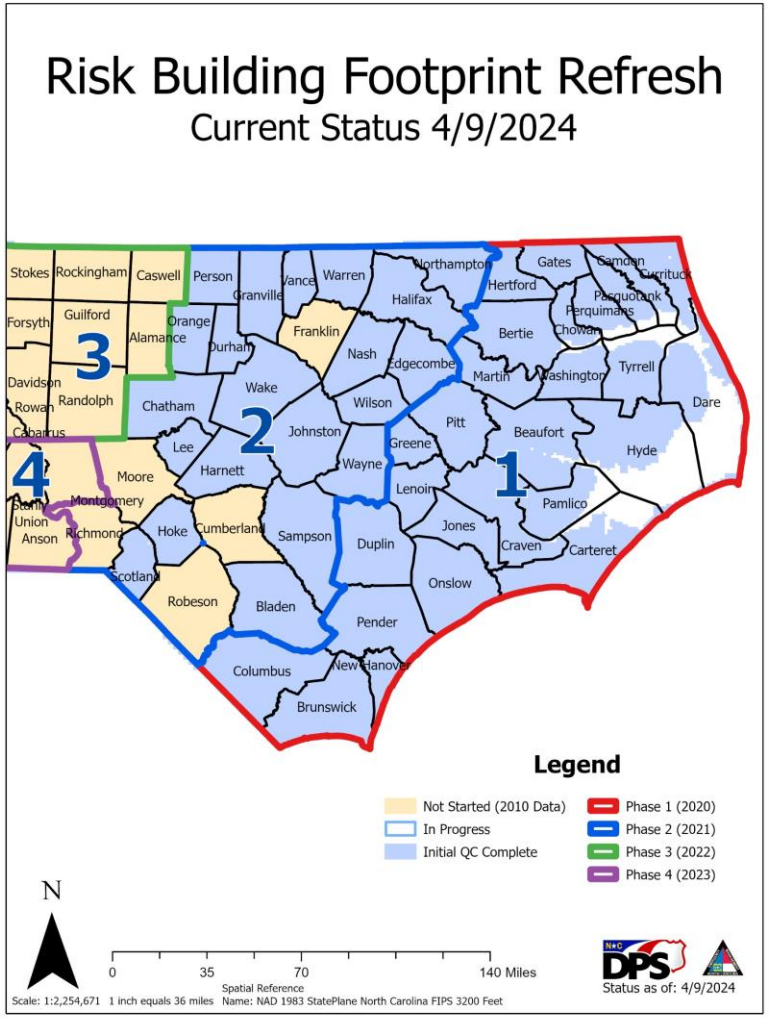

PITT

Windsor Flooding

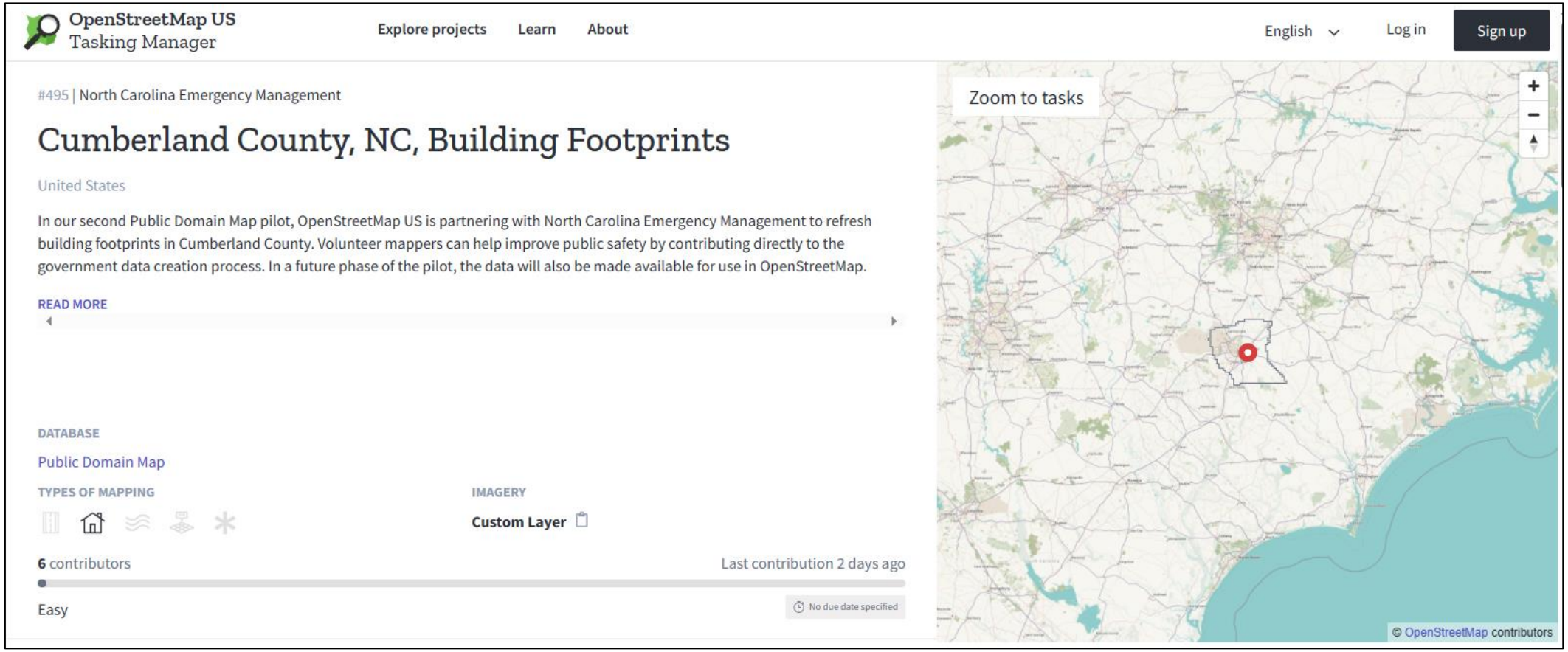
9/22/16 - Morning



Building Footprint Update Status



Will start working on Area 3 (2022 imagery area) in May with five (5) staff working on the project.


OpenStreetMap US
Tasking Manager
Explore projects
Learn
About
English
Log in
Sign up
#495 | North Carolina Emergency Management
Cumberland County, NC, Building Footprints
United States
In our second Public Domain Map pilot, OpenStreetMap US is partnering with North Carolina Emergency Management to refresh building footprints in Cumberland County. Volunteer mappers can help improve public safety by contributing directly to the government data creation process. In a future phase of the pilot, the data will also be made available for use in OpenStreetMap.
READ MORE
DATABASE
Public Domain Map
TYPES OF MAPPING
IMAGERY
Custom Layer
6 contributors
Last contribution 2 days ago
Easy
No due date specified
Zoom to tasks
© OpenStreetMap contributors

Questions?

Gary Thompson, PLS
Deputy Hazard Mitigation Chief
NC Geodetic Survey Chief
200 Park Offices Drive
Durham, NC 27713

Main office: 919-733-3836
Direct line: 919-948-7844

gary.thompson@ncdps.gov