

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



## **State Mapping Advisory Committee April 20, 2022**

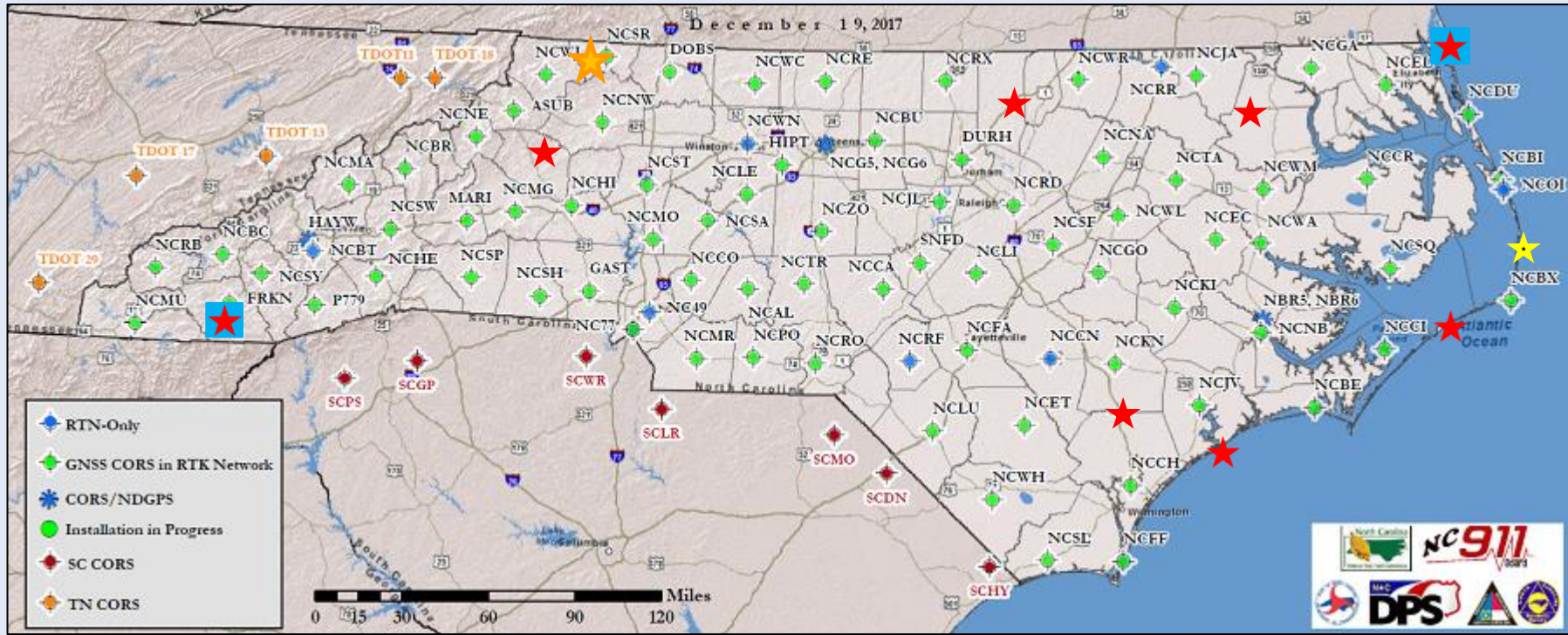
### **Geodetic Control**



**North Carolina Emergency Management**



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



Future CORS location = ★  
 CORS installed = ★  
 Earthquake CORS = ★  
 Installation April 2022 = ★



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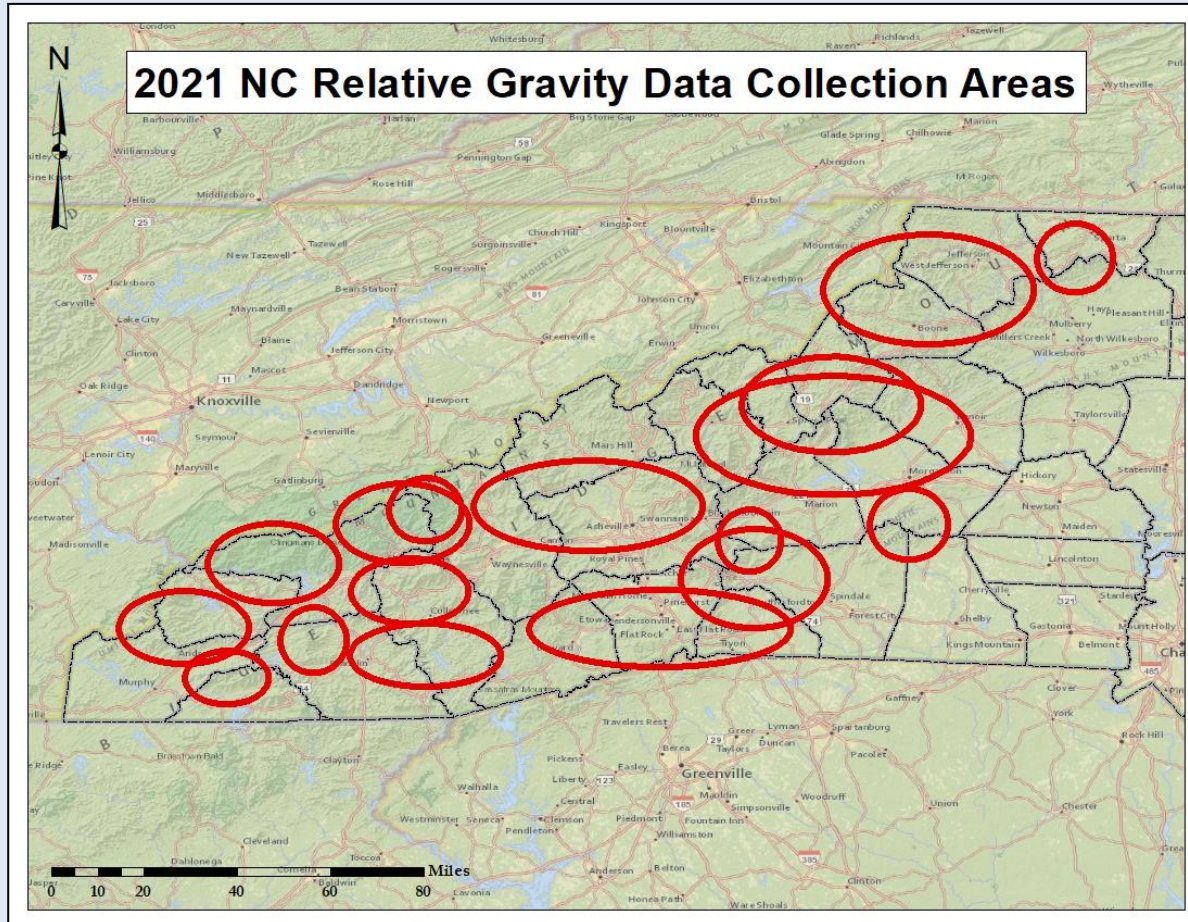
# OPUS-Projects 5.0

- Inclusion of previously processed GNSS vectors
  - Single-base Real Time Kinematic (RTK) vectors
  - Network RTK vectors
  - Vectors processed in other software

The screenshot shows a NOAA bulletin with the following content:

- NOAA NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION** (UNITED STATES DEPARTMENT OF COMMERCE)
- NGS Releases BETA OPUS Projects 5.0 — Now accepting RTK data**  
NOAA's National Ocean Service sent this bulletin at 09/16/2021 11:24 AM EDT
- National Geodetic Survey**
- Test New Features in BETA OPUS Projects 5.0**
- Users can now upload GNSS vectors into OPUS projects, including vectors derived from either a single-base real-time kinematic (RTK) setup or from a real-time network (RTN), for evaluation, quality assessment, and inclusion in a GNSS survey network for least squares adjustment. Use the new GNSS Vector Exchange (GVX) file format to transfer data from various manufacturer hardware to OPUS Projects 5.0.
- Getting started:**
  - Use sample data that are available online and in the GVX file format.
  - Talk to your vendor about converting your own GNSS vector data to the GVX file format.
- Learn More about OPUS Projects 5.0**  
For an overview of the new features check out the recent NGS webinar from May 20, 2021.
- OPUS-Projects for RTK/RTN Vectors**  
NGS is developing OPUS-Projects so that GNSS vectors, including those from real-time kinematic (RTK) surveys, can be uploaded to a survey network for least-squares adjustment and submittal to NGS for publication. This has required developing a standardized GNSS vector exchange format known as GVX.
- \*Technical Content Rating: Advanced - Prior knowledge of this topic is suggested.
- NGS Welcomes Your Feedback**  
NGS continually works to improve our services and releases beta versions of new or improved products for external testing and feedback. Please look for the new Feedback icon that appears on the right side of our OPUS pages. Click the icon to answer a short survey with your feedback, which will be used to make future improvements to OPUS. Or try uploading and working with GVX files in Beta OPUS Projects 5.0 and email your feedback to [ngs.feedback@noaa.gov](mailto:ngs.feedback@noaa.gov).
- Send feedback on Beta OPUS Projects 5.0 at any time, by emailing [ngs.feedback@noaa.gov](mailto:ngs.feedback@noaa.gov).
- NOAA's National Geodetic Survey  
[geodesy.noaa.gov](http://geodesy.noaa.gov)
- Stay Connected with NOAA's National Ocean Service  
[Manage Subscriptions](#)

# Gravity Data Collection

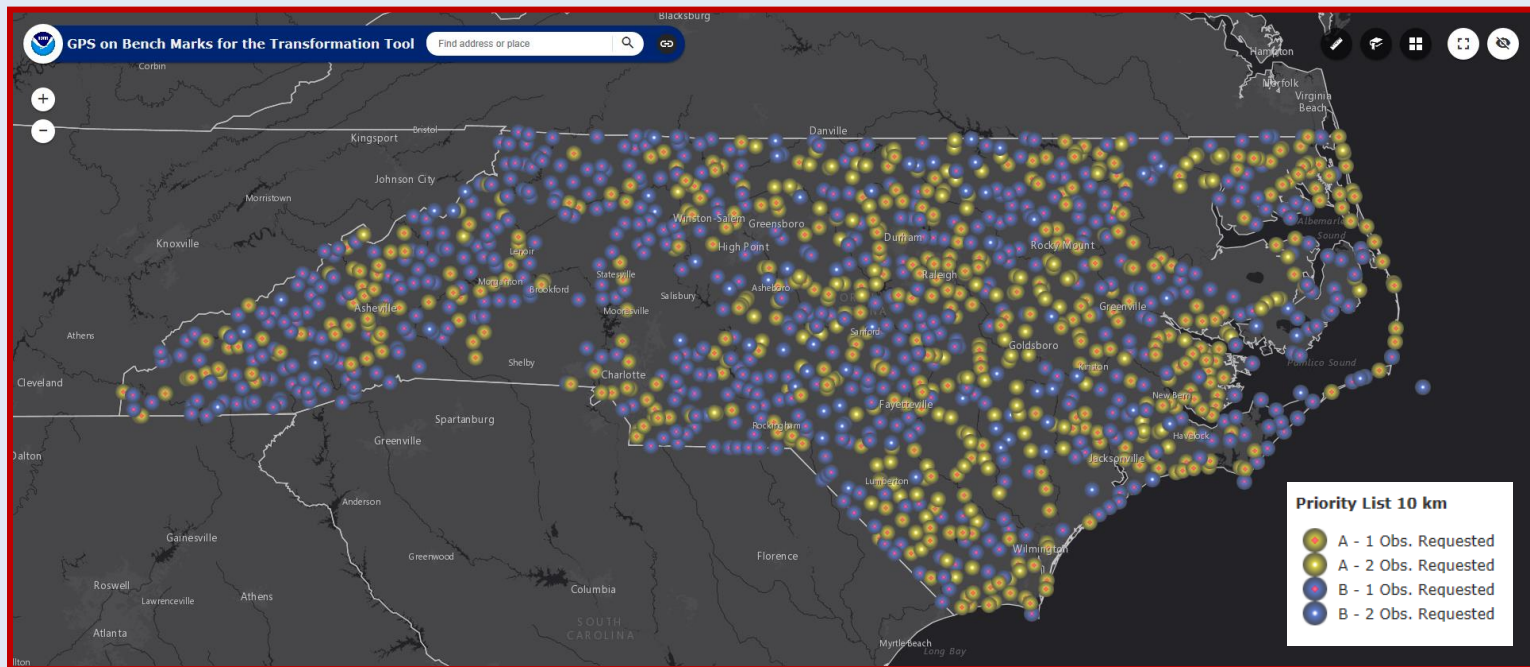


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# National Geodetic Survey GPS on Bench Marks 2020/2021

- 2020
  - NGS has prepared a list of geodetic monuments that we review for possible GNSS data collection

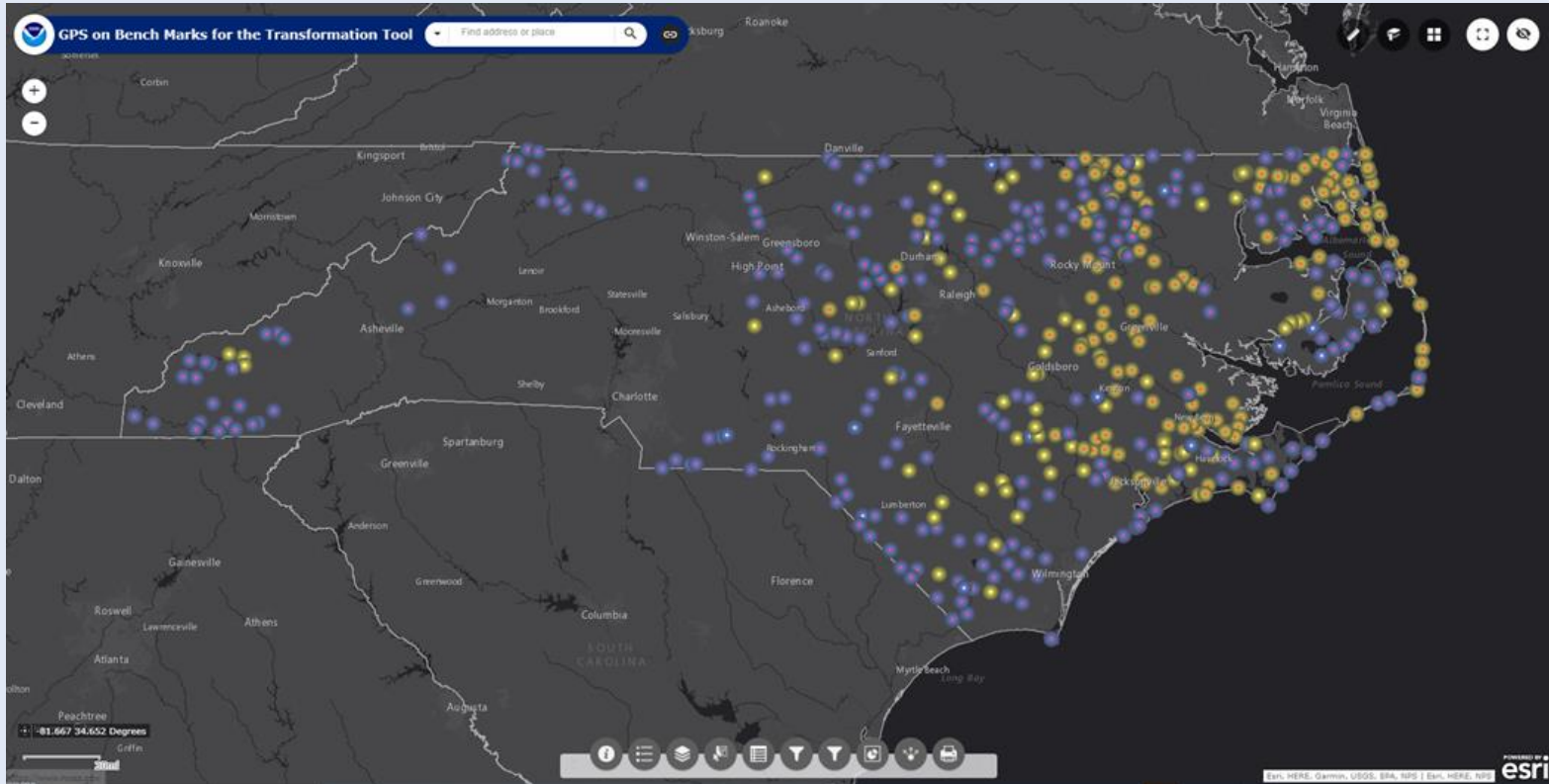


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# National Geodetic Survey GPS on Bench Marks 2020/2021

- 2021 (status as of 3/31/2022)

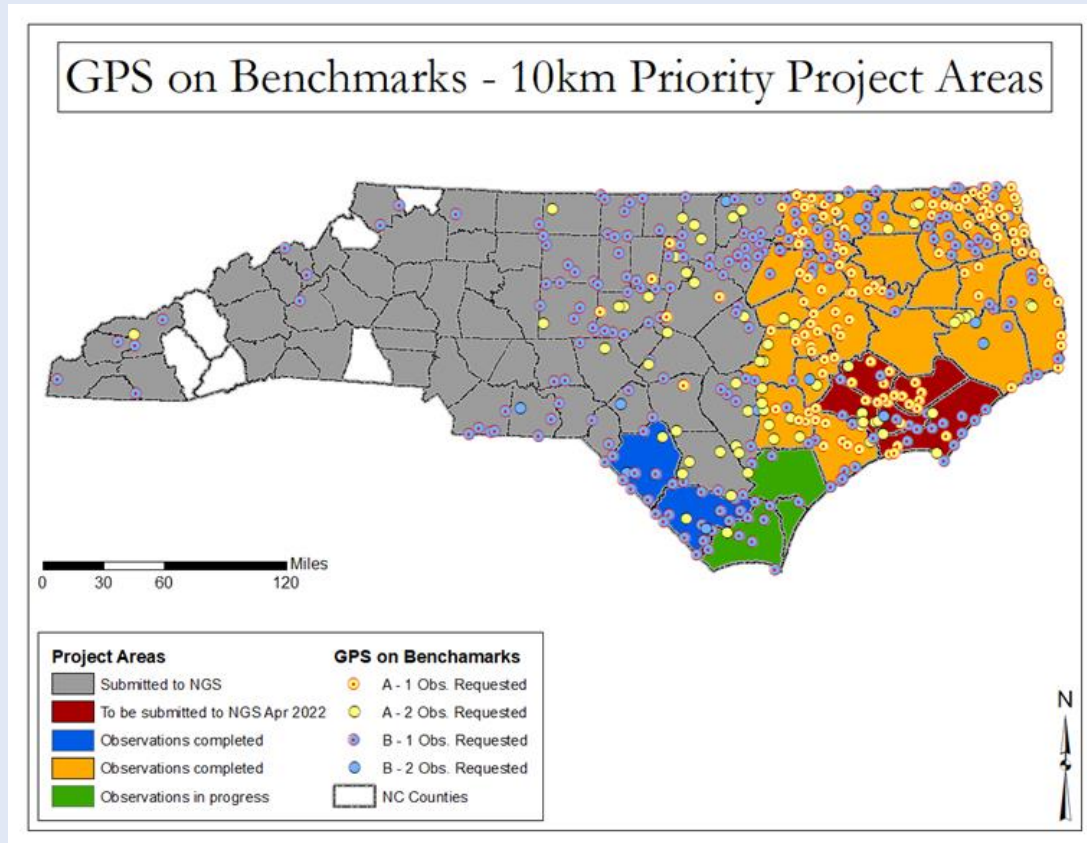


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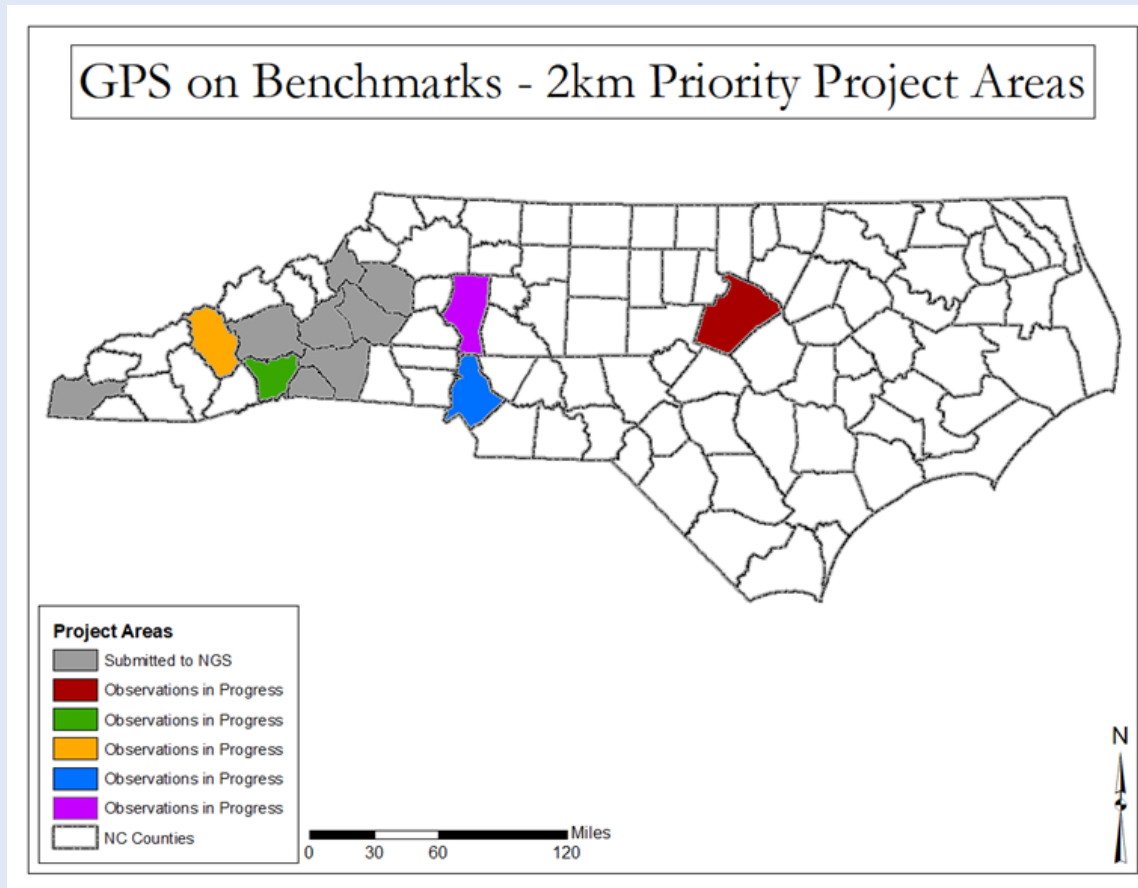
# National Geodetic Survey GPS on Bench Marks 2020/2021

- Projects in progress



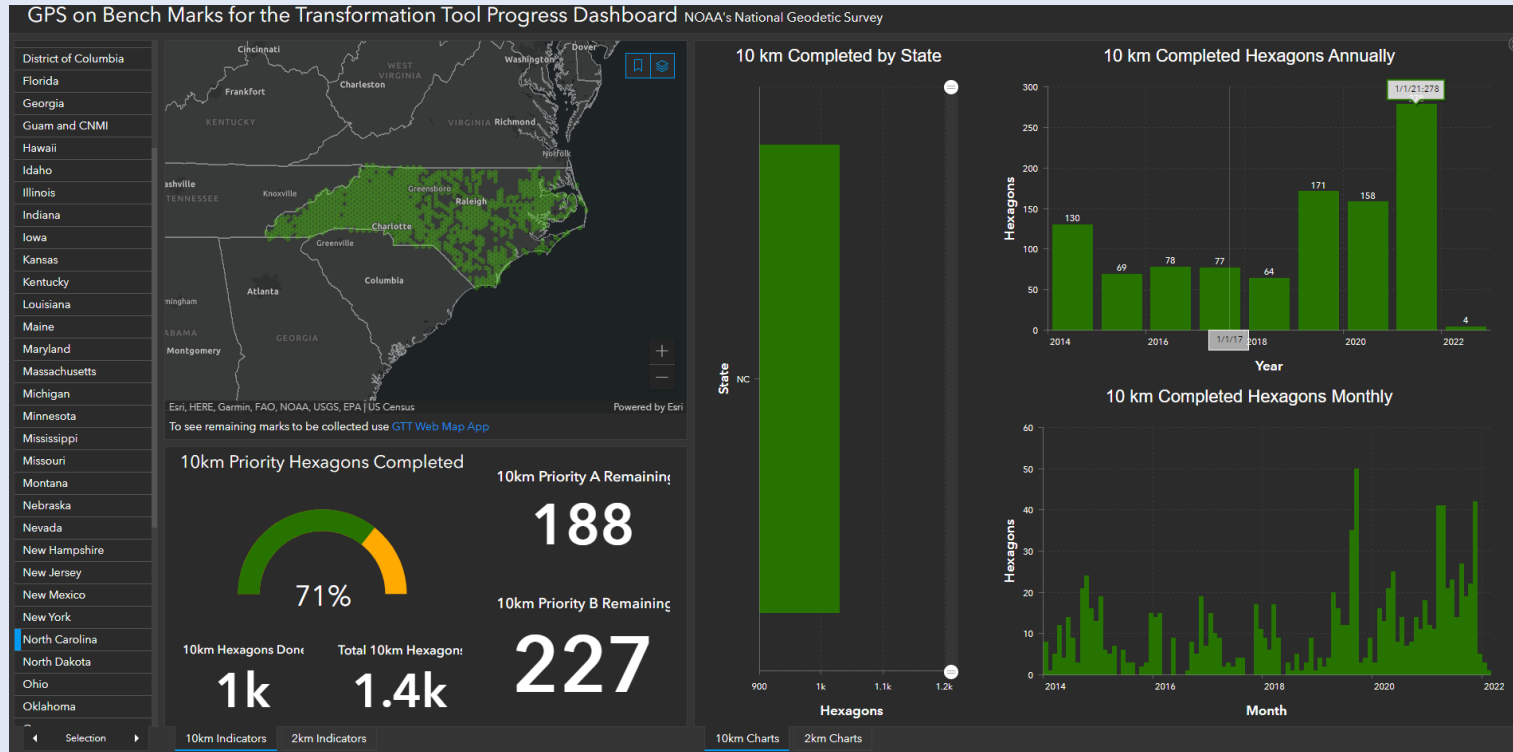
# National Geodetic Survey GPS on Bench Marks 2020/2021

- Projects in progress





# North Carolina's Progress Dashboard



## GPS on BenchMarks

\*\*\* NOTICE: NGS has extended the December 31, 2021 cut-off date for GPS on Bench Mark submissions! The new cut-off date to submit GPS on Bench Mark data for use in the 2022 Transformation Tool is now December, 31, 2022. \*\*\*




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# New Datums are Coming! 2024- 2025

National Geodetic Survey Positioning America for the Future geodesy.noaa.gov



## New Datums Are Coming!

**NOAA is Replacing NAD 83 and NAVD 88.** NOAA's National Geodetic Survey (NGS) will be replacing the datums of the National Spatial Reference System (NSRS), including the **North American Datum of 1983 (NAD 83)** and the **North American Vertical Datum of 1988 (NAVD 88)**. NGS will provide the tools to easily transform between the new and old datums. Read the NGS Ten-Year Plan and visit the **New Datums Web page** on our site to learn more.

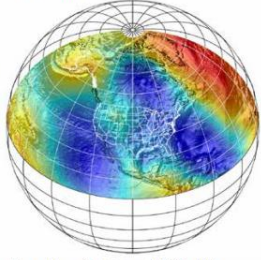
**Benefits**  
The new reference frames (geometric and geopotential) will rely primarily on **Global Navigation Satellite Systems (GNSS)**, such as the Global Positioning System (GPS), as well as on a gravimetric geoid model resulting from NGS' **Gravity for the Redefinition of the American Vertical Datum (GRAV-D)** Project.

The target accuracy of differential orthometric heights (heights relative to sea level) in the geopotential reference frame will be 2 centimeters over any distance, where possible.

**What You Can Expect**  
The magnitude of change with the new datums will vary depending on the datum you are using and your geographic location. The new geometric datum will change latitude, longitude, and ellipsoid height between 1 and 4 meters. In the conterminous United States (CONUS), the new vertical datum will change heights on average 50 centimeters, with approximately a 1-meter tilt towards the Pacific Northwest.

**How You Can Prepare**

- Learn if **legislation** or other formal documents referencing NAD 83 and NAVD 88 need to be changed in your state.
- **Transform existing data** to the latest NSRS datums and realizations; i.e. NAD 83 (2011), GEOID18, and NAVD 88.
- **Obtain precise ellipsoidal heights** on NAVD 88 bench marks, and visit the GPS on Bench Marks Web page to learn more.
- Require and provide **complete metadata** on all mapping contracts. See our website for more details.



*The new datums will extend across CONUS and U.S. territories. The terrestrial reference frames replacing NAD 83 will be consistent with geocentric global reference frames defining latitude and longitude. The geopotential datum replacing NAVD 88 will be based on a gravimetric geoid model, enhanced by data from NGS' Gravity for the Redefinition of the American Vertical Datum (GRAV-D) Project.*

National Oceanic and Atmospheric Administration • National Geodetic Survey

Draft revisions to North Carolina General Statute 102 is being developed



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