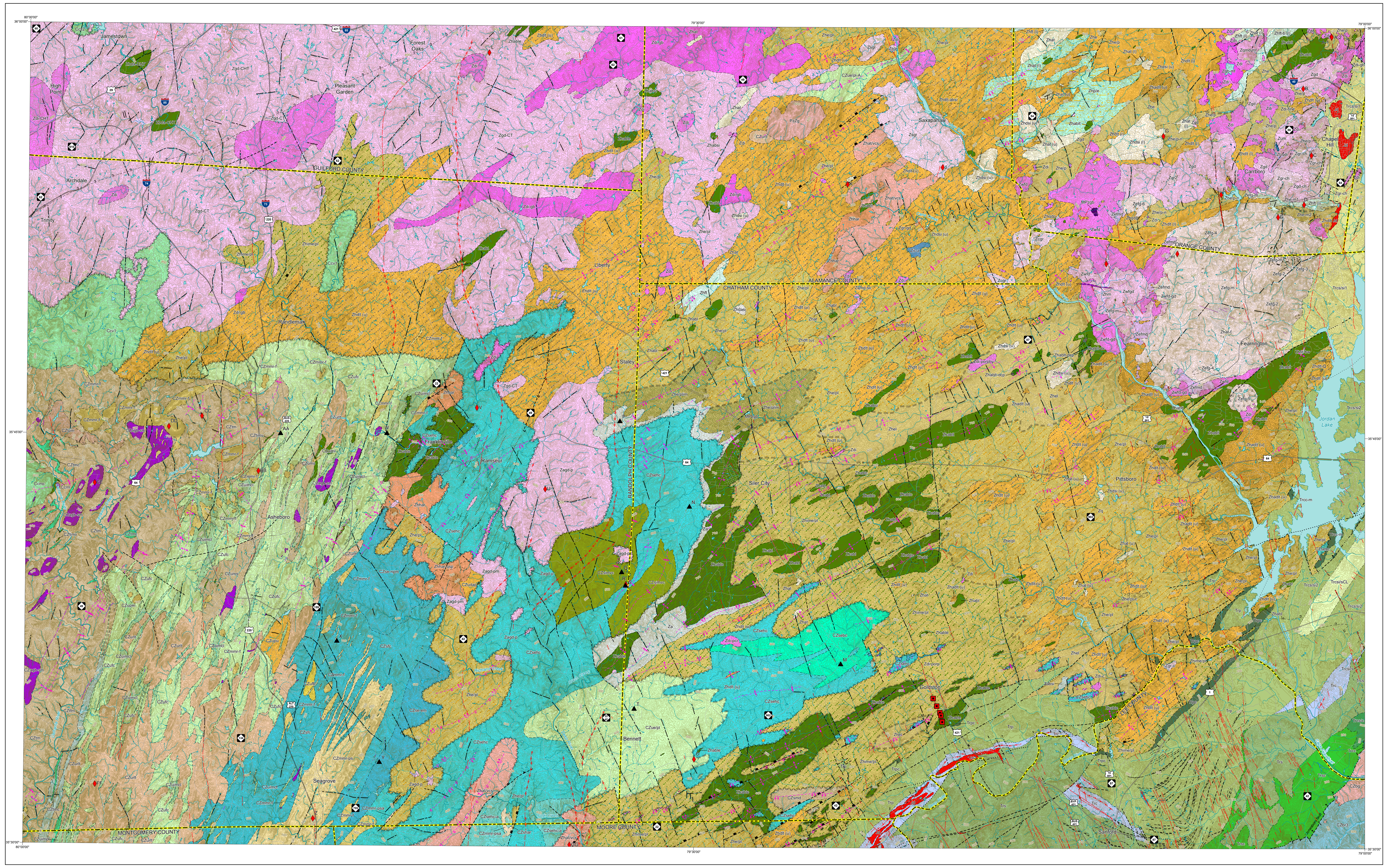
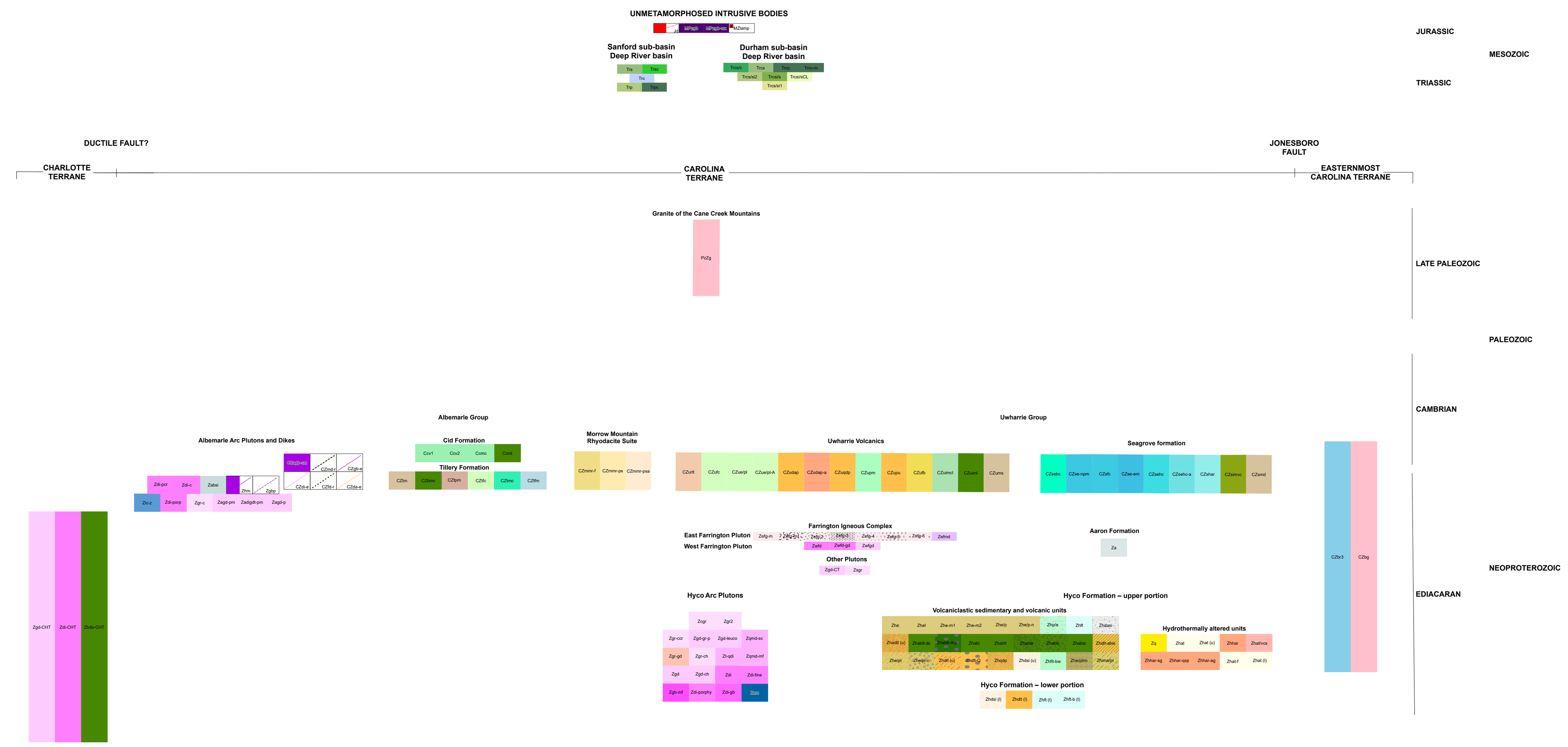
North Carolina Department of Environmental Quality
Division of Energy, Mineral, and Land Resources
William E. Toby Vinson, Jr., Director
Dwain M. Veach, State Geologist and Section Chief, NC Geological Survey

This geologic map was funded in part by the USGS National Cooperative Geologic Mapping Program

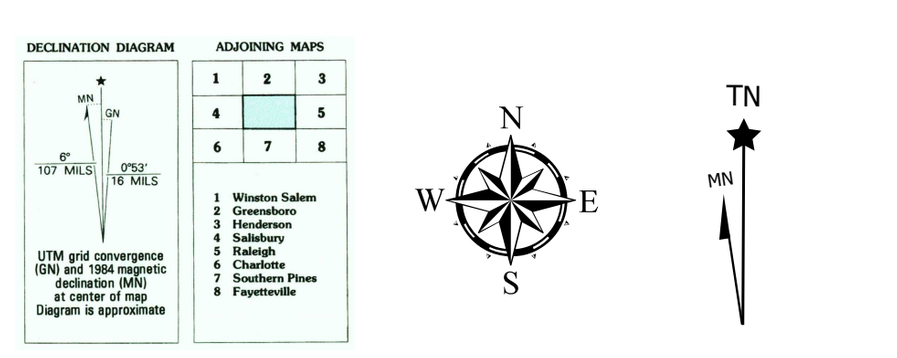


CORRELATION OF MAP UNITS

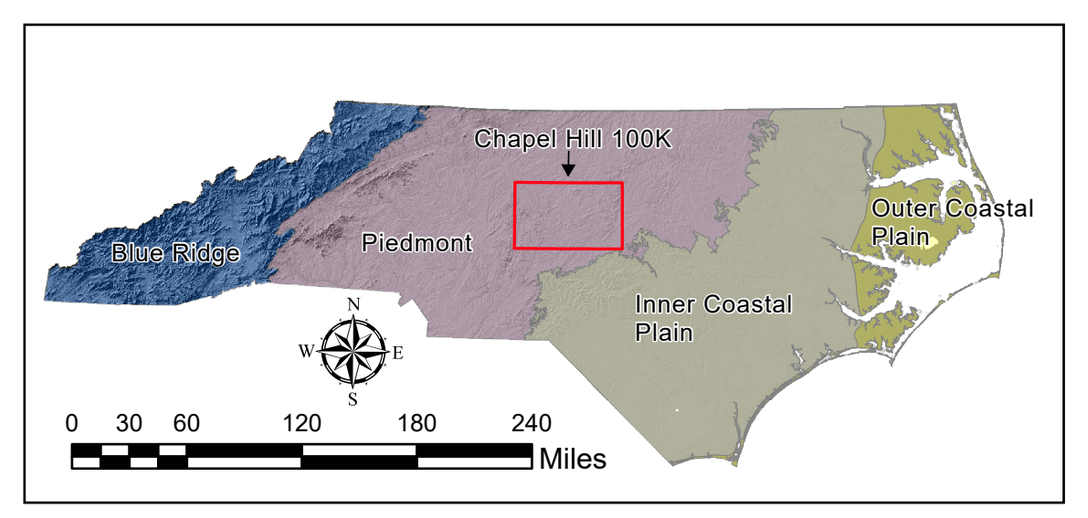


LIST OF MAP UNITS

[See Description of Map Units (in pamphlet) for complete unit descriptions and age information]



Magnetic north declination -8° 53'
(NOAA National Centers for Environmental Information Website, April 5, 2024)



CONTACTS, FAULTS, AND OTHER FEATURES

normal fault
high angle reverse fault
thrust fault
lidar lineament
anticline
syncline
overturned anticline
overturned syncline
coal bed (Reinemund, 1955)
conglomerate beds (Reinemund, 1955)

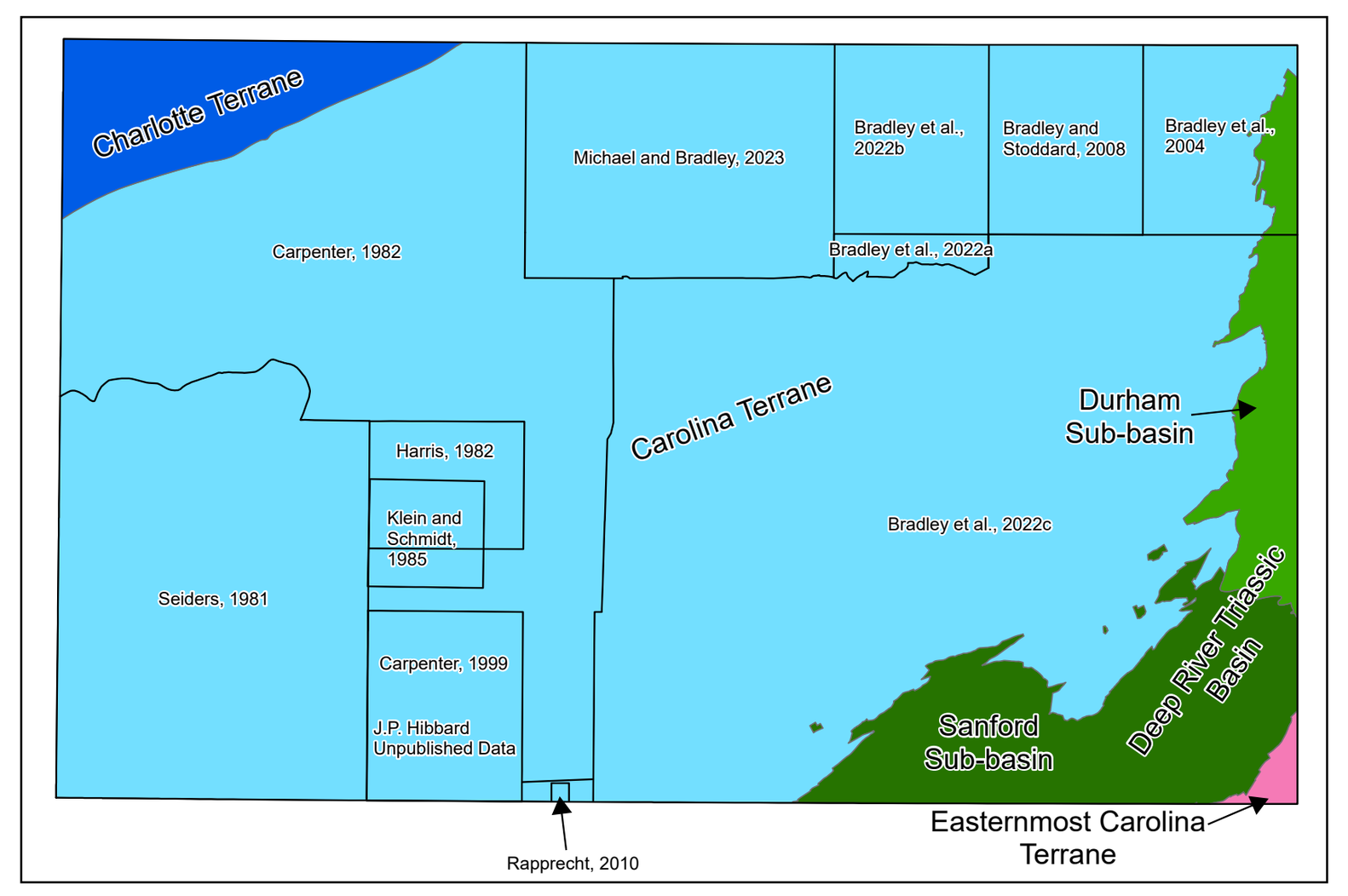
DIKES

CZda-e, dacite in the Erect quadrangle
CZdi-e, diorite in the Erect quadrangle
CZmd-r, mafic porphyry of the Ramseur area
CZfd-r, felsic porphyry of the Ramseur area
CZabg-sm, Stony Mountain gabbro
Zgbp, gabbro to gabbro porphyry
Zhm, Hunter Mountain

GEOCHRONOLOGY DATA LOCATIONS

0 2.5 5 10 15 20 Miles
0 12,500 25,000 50,000 75,000 100,000 US Feet
0 2.5 5 10 15 20 Kilometers

COUNTOUR INTERVAL - 10 FEET



Major geologic elements and terrane map with an index of STATEMAP and Legacy maps used in this compilation. New field work was conducted in 2023 and 2024 to rectify internal edge-match issues.

Declination diagram and map of adjoining 100K quadrangles is from USGS 1984 GeoTiff of the Chapel Hill 30 X 60 quadrangle. Basemap contours provided courtesy of the USGS National Elevation Dataset. Other data provided courtesy of NC One Map.

Research supported by the U.S. Geological Survey, National Cooperative Geologic Mapping Program under STATEMAP (Award 2023, G23AC00464).

Acknowledgments: Many thanks to James P. Hibbard for the discussions, guidance, and continued assistance with enhancing the understanding of the Carolina terrane.

Thanks to Joe Moye for reviving discussions of the stratigraphy in the Carolina terrane with his paper *The Albemarle Sequence of the Carolina Terrane in Central North Carolina: Geologic and metallogenic analysis with an alternative model* (Moye, 2023).

Emily K. Michael digitized legacy linework in the Asheboro and Ramseur areas. Michael A. Medina contributed significantly to cartographic work for the Chatham County portions of the map area.

This compiled geologic map, partially supported by the U.S. Geological Survey (USGS), National Cooperative Geologic Mapping Program under STATEMAP completes a multi-year project to compile the entire bedrock portion of the Chapel Hill 30'x 60' Quadrangle (Chapel Hill 100K) in support of the USGS US Geoframework Initiative's vision for a nation-wide, seamless geologic map.

The goal of this compilation effort was to produce a new 1:100,000-scale digital geologic map of the study area using the USGS Geologic Mapping Schema (GeMS). When available, geologic data at scales more detailed than 1:100,000-scale were used (i.e. 1:24,000-scale data). Data from the more detailed maps were preserved at the scale originally mapped. As such, some map unit polygons are very small on this 100,000-scale map and are unlabeled. The unit name of the unlabeled polygon can typically be interpreted from nearby labeled polygons. The GeMS digital database should be utilized in conjunction with this layout version of the map.

This compilation effort compiled legacy data at scales ranging from 125K- to 24K-scale. From July 2023 to June 2024, NCGS staff conducted targeted foot and vehicle traverses to validate contacts from legacy sources and to collect new field data. Close attention was paid to rectifying edge-match issues between legacy data and recent 24K-scale mapping to allow accurate transitions of map units from areas with detailed data to areas of legacy data collected at smaller scales (e.g. 48K). More detailed and closer spaced traverses targeted areas of structural or stratigraphic complexity. Less detailed and wider spaced traverses were used in areas of less complex structure or rock types (e.g. areas underlain by homogenous plutons received less attention). LiDAR elevation data displayed as hillshade was used to help identify lineaments and possible faults and dikes that may be groundwater sources or preferred pathways for groundwater contaminants.

See accompanying pamphlet for detailed unit descriptions and additional information.

Compiled Bedrock Geologic Map of the Chapel Hill 30' x 60' Quadrangle (Chapel Hill 100K), North Carolina

New data collection and compilation work by: Philip J. Bradley, Garett J. Thompson, and Katherine E. Pelt
Cartographic representation by: Garett J. Thompson, Philip J. Bradley, and Michael A. Medina
New geochronology data reduction and interpretation by Adam C. Curry

Version 12/12/2025

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