DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF LAND RESOURCES

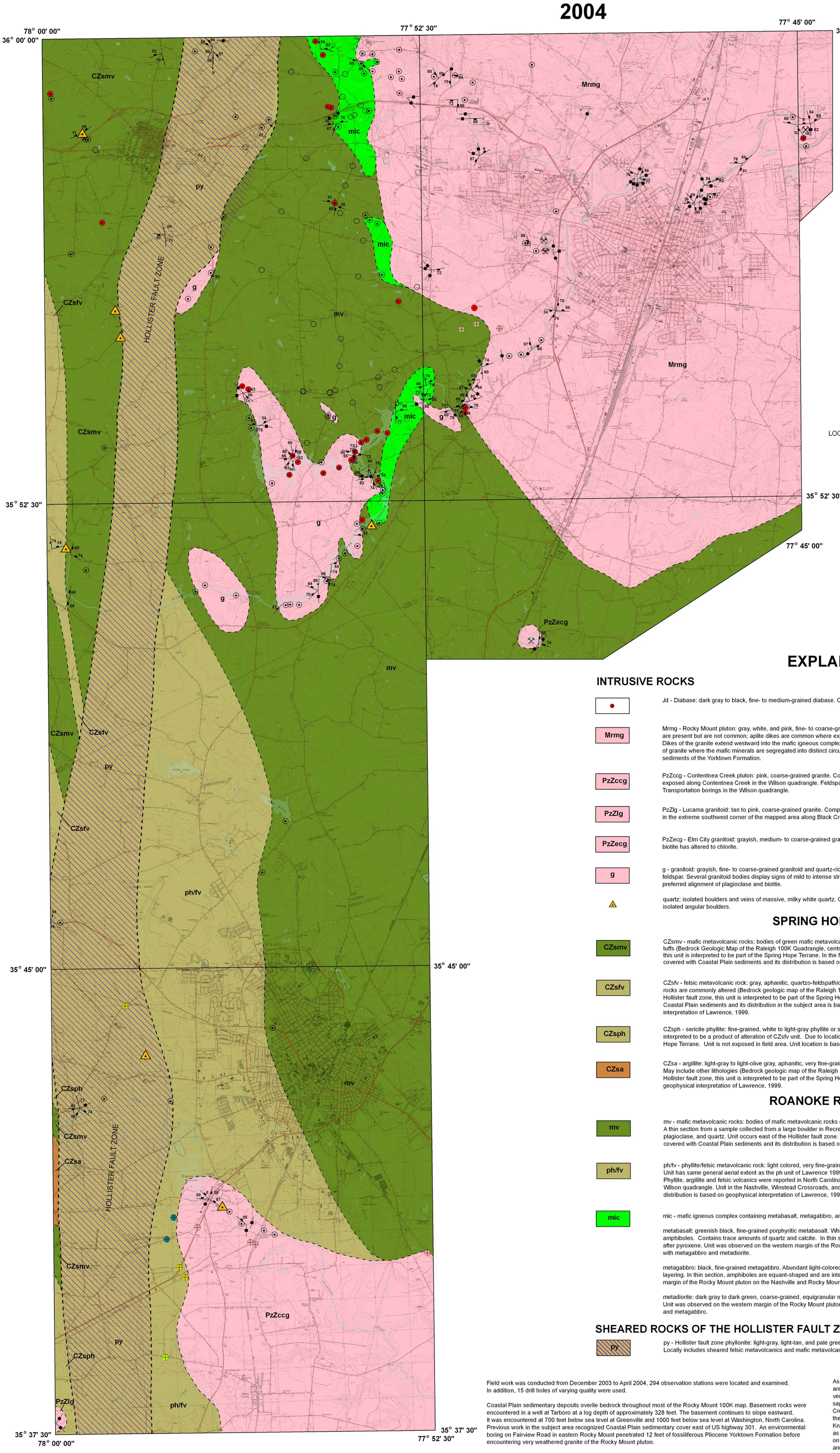
NORTH CAROLINA GEOLOGICAL SURVEY
OPEN FILE REPORT 2004-05

THE BEDROCK GEOLOGY OF THE WESTERN PORTION OF THE ROCKY MOUNT 100K QUADRANGLE, NASH, WILSON, AND EDGECOMBE COUNTIES, NORTH CAROLINA

BY NORMAN K. GAY

Digital representation by Michael A. Medina

2004



CONTACTS

inferred lithologic contact

inferred fault contact

STRUCTURAL SYMBOLS

- foliation
- vertical foliation
- shear foliation
- joint
- vertical joint
- lineation
- quarry
- inactive quarry

DRILL POINTS

Drill data from Moncla, 1990
- diabase
- granite
- metamorphic rock

Drill data provided by North Carolina Department of Transportation
- argillite
- phyllite
- Contentnea Creek pluton

Drill data provided by private environmental consultants
- mafic metavolcanic

- observation location
- saprolite location

1 0.5 0 1 2 Miles

5000 0 5000 10,000 Feet

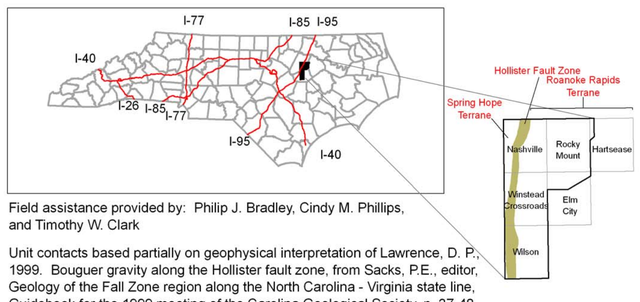
1,250 625 0 1,250 2,500 Meters

1:50,000 SCALE

CONTOUR INTERVAL 10 FEET

Lambert Conformal Conic projection
North Carolina State Plane
NAD 83 meters coordinate system

LOCATION OF THE NASHVILLE, WINSTEAD CROSSROADS, WILSON, ROCKY MOUNT, ELM CITY, AND HARTSEASE 7.5-MINUTE QUADRANGLES, NORTH CAROLINA



Field assistance provided by: Philip J. Bradley, Cindy M. Phillips, and Timothy W. Clark

Unit contacts based partially on geophysical interpretation of Lawrence, D. P., 1999. Bouguer gravity along the Hollister fault zone, from Sacks, P.E., editor, Geology of the Fall Zone region along the North Carolina - Virginia state line, Guidebook for the 1999 meeting of the Carolina Geological Society, p. 37-48.

Disclaimer:
This Open-File report is preliminary and has not been reviewed for conformity with the North Carolina Geological Survey editorial standards or with the North American Stratigraphic Code. Further revisions or corrections to this preliminary map may occur prior to its release as a North Carolina Geological Survey map.

EXPLANATION

INTRUSIVE ROCKS

Jd - Diabase: dark gray to black, fine- to medium-grained diabase. Occurs as dikes but is usually found in the mapped area as isolated rounded boulders.

Mrmg - Rocky Mount pluton: gray, white, and pink, fine- to coarse-grained to megacrystic, monzogranite, biotite-rich granite, and granodiorite. Pegmatites are present but are not common; aplite dikes are common where exposures are large. A Rb-Sr age of 345 +/- 1 Ma has been reported (Moncla, 1990). Dikes of the granite extend westward into the mafic igneous complex (mic). In southwestern Rocky Mount quadrangle there is a texturally distinct phase of granite where the mafic minerals are segregated into distinct circular aggregates. The eastern portion of the pluton is covered with Coastal Plain sediments of the Yorktown Formation.

PzZccg - Contentnea Creek pluton: pink, coarse-grained granite. Composed of potassium feldspar, quartz, plagioclase, and < 5% biotite. The pluton is exposed along Contentnea Creek in the Wilson quadrangle. Feldspathic megacrystic granite has been reported in North Carolina Department of Transportation borings in the Wilson quadrangle.

PzZlg - Lucama granitoid: tan to pink, coarse-grained granite. Composed of potassium feldspar, plagioclase, quartz, and biotite. The granitoid is found in the extreme southwest corner of the mapped area along Black Creek, its relationship with the Contentnea Creek pluton is unknown.

PzZecg - Elm City granitoid: grayish, medium- to coarse-grained granite. Composed of plagioclase, quartz, potassium feldspar, and biotite. Some of the biotite has altered to chlorite.

g - granitoid: grayish, fine- to coarse-grained granitoid and quartz-rich granitoid. Composed of quartz, plagioclase, biotite, muscovite, and +/- potassium feldspar. Several granitoid bodies display signs of mild to intense strain as indicated by mineral lineations of blue and gray quartz and apparent preferred alignment of plagioclase and biotite.

quartz: isolated boulders and veins of massive, milky white quartz. Quartz is locally vuggy. Occurs in veins, but usually found in the mapped area as isolated angular boulders.

SPRING HOPE TERRANE

CZsmv - mafic metavolcanic rocks: bodies of green mafic metavolcanic rocks consisting of chloritic phyllite, greenstone, and very fine-grained mafic tuffs (Bedrock Geologic Map of the Raleigh 100K Quadrangle, central North Carolina, unpublished). Due to location west of the Hollister fault zone, this unit is interpreted to be part of the Spring Hope Terrane. In the Nashville and northern Winstead Crossroads quadrangles, the unit is mostly covered with Coastal Plain sediments and its distribution is based on sparse outcrop locations and the geophysical data of Lawrence, 1999.

CZsfv - felsic metavolcanic rock: gray, aphanitic, quartzo-feldspathic, metavolcanic rock interpreted to be vitric and vitric crystal tuff. Felsic volcanic rocks are commonly altered (Bedrock geologic map of the Raleigh 100K quadrangle, central North Carolina, unpublished). Due to location west of the Hollister fault zone, this unit is interpreted to be part of the Spring Hope Terrane. Unit in the Winstead Crossroads quadrangle is mostly covered with Coastal Plain sediments and its distribution in the subject area is based on two outcrop locations along the Tar River and the geophysical interpretation of Lawrence, 1999.

CZsph - sericite phyllite: fine-grained, white to light-gray phyllite or schist. Locally includes felsic metavolcanic rock and quartz-epidote rock. Unit is interpreted to be a product of alteration of CZsfv unit. Due to location west of the Hollister Fault Zone, this unit is interpreted to be part of the Spring Hope Terrane. Unit is not exposed in field area. Unit location is based solely on geophysical interpretation of Lawrence, 1999.

CZsa - argillite: light-gray to light-olive gray, aphanitic, very fine-grained, laminated argillite, containing chlorite, +/- muscovite layers generally <1 mm thick. May include other lithologies (Bedrock geologic map of the Raleigh 100K quadrangle, central North Carolina, unpublished). Due to location west of the Hollister fault zone, this unit is interpreted to be part of the Spring Hope Terrane. Unit is not exposed in the field area. Unit location is based solely on geophysical interpretation of Lawrence, 1999.

ROANOKE RAPIDS TERRANE

mv - mafic metavolcanic rocks: bodies of mafic metavolcanic rocks consisting of chloritic phyllite, greenstone, crystal tuffs, and felsic metavolcanics. A thin section from a sample collected from a large boulder in Recreation Park, Wilson, indicated the presence of pyroxene, uralitized pyroxene, plagioclase, and quartz. Unit occurs east of the Hollister fault zone. Unit in the Nashville, Winstead Crossroads, and Wilson quadrangles is mostly covered with Coastal Plain sediments and its distribution is based on limited outcrop locations and on geophysical interpretation of Lawrence, 1999.

ph/fv - phyllite/felsic metavolcanic rock: light colored, very fine-grained phyllite and felsic metavolcanic rock. Unit is not exposed in the field area. Unit has same general aerial extent as the ph unit of Lawrence 1999, with contact lines adjusted based on field observations of neighboring units. Phyllite, argillite and felsic volcanics were reported in North Carolina Department of Transportation boring logs in the southwestern portion of the Wilson quadrangle. Unit in the Nashville, Winstead Crossroads, and Wilson quadrangles is covered with Coastal Plain sediments and its distribution is based on geophysical interpretation of Lawrence, 1999.

mic - mafic igneous complex containing metabasalt, metagabbro, and metadiorite

metabasalt: greenish black, fine-grained porphyritic metabasalt. White to very pale green plagioclase laths to 8 mm, in a groundmass of fine-grained amphiboles. Contains trace amounts of quartz and calcite. In thin section, amphiboles are equant-shaped and are interpreted to be pseudomorphs after pyroxene. Unit was observed on the western margin of the Rocky Mount pluton on the Nashville and Rocky Mount quadrangles in association with metagabbro and metadiorite.

metagabbro: black, fine-grained metagabbro. Abundant light-colored plagioclase in 2 - 4 mm thick zones may be related to original magmatic layering. In thin section, amphiboles are equant-shaped and are interpreted to be pseudomorphs after pyroxene. Unit was observed on the western margin of the Rocky Mount pluton on the Nashville and Rocky Mount quadrangles in association with metabasalt and metadiorite.

metadiorite: dark gray to dark green, coarse-grained, equigranular metadiorite. In thin section, hornblende, biotite and rare actinolite were observed. Unit was observed on the western margin of the Rocky Mount pluton on the Nashville and Rocky Mount quadrangles in association with metabasalt and metagabbro.

SHEARED ROCKS OF THE HOLLISTER FAULT ZONE

py - Hollister fault zone phyllonite: light-gray, light-tan, and pale green, very fine grained, very thinly foliated, locally crenulated, sheared phyllonite. Locally includes sheared felsic metavolcanics and mafic metavolcanic rock.

Field work was conducted from December 2003 to April 2004, 294 observation stations were located and examined. In addition, 15 drill holes of varying quality were used.

Coastal Plain sedimentary deposits overlie bedrock throughout most of the Rocky Mount 100K map. Basement rocks were encountered in a well at Tarboro at a log depth of approximately 328 feet. The basement continues to slope eastward. It was encountered at 700 feet below sea level at Greenville and 1000 feet below sea level at Washington, North Carolina. Previous work in the subject area recognized Coastal Plain sedimentary cover east of US highway 301. An environmental boring on Fairview Road in eastern Rocky Mount penetrated 12 feet of fossiliferous Pliocene Yorktown Formation before encountering very weathered granite of the Rocky Mount pluton.

As a result of this prior knowledge, the majority of the mapping was concentrated west of US 301. All roads in the mapped area were traversed, all outcrops along the roads were examined, and the lithology was delineated. Most outcrops were very weathered saprolite or Coastal Plain sediments. Occasionally, it was possible to identify the original rock type from the saprolite. All major streams were traversed by canoe (the Tar River including the shoreline of the Tar River Reservoir, Stony Creek, Contentnea Creek, and portions of Black Creek and Sapony Creek). The majority of data points were found along these streams. Many of the smaller streams were traversed on foot. For several reasons some streams were not traversed. Known elevations of the Coastal Plain and basement contact was in many places well below the base of the stream valley as shown on the topographic base map. Many of the streams have wide floodplains with thick alluvial fill. Stream valleys on the east side of the mapped quadrangles are not deep enough to penetrate the Coastal Plain sediments and alluvium and expose crystalline rocks. The eastern streams have wide floodplains thick with heavy vegetation that are difficult or impossible to enter.