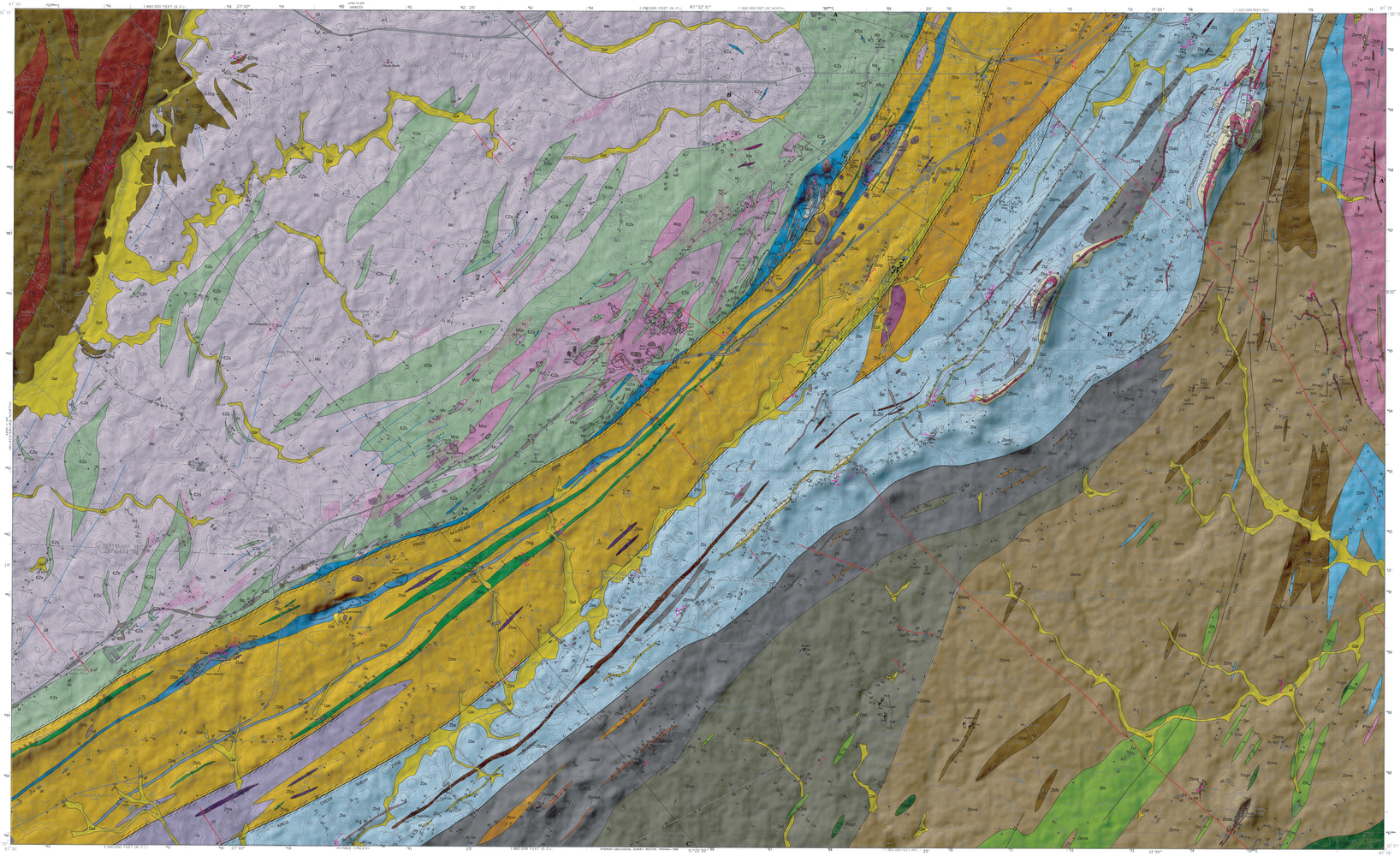
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

Prepared in cooperation with the
NATIONAL PARK SERVICE

OPEN FILE REPORT 2006-1238
*Explanatory text and description of map units accompanies map*



Base from U.S. Geological Survey, 1971
Lambert conformical conic projection.
10,000- foot grid ticks based on North Carolina and South Carolina coordinate systems.
UTM grids and 1-kilometer Universal Transverse Mercator grid ticks, Zone 17.
1927 North American Datum.

APPROXIMATE MEAN DECLINATION, 1971

SCALE 1:24 000

1 1/2 0 1 MILE

1 .5 0 1 KILOMETER

COUNTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

INTERIOR—GEOLOGICAL SURVEY, RESTON, VIRGINIA—1994

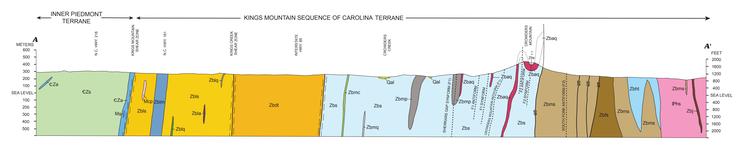
7.5 - MINUTE QUADRANGLE LOCATIONS

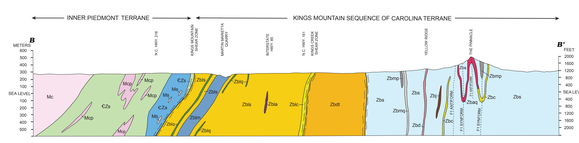
| | | | |
|---|---|---|---|
| 1 | 2 | 3 | 4 |
| 5 | GROVER NORTH | GROVER SOUTH | 6 |
| 7 | 8 | 9 | 10 |

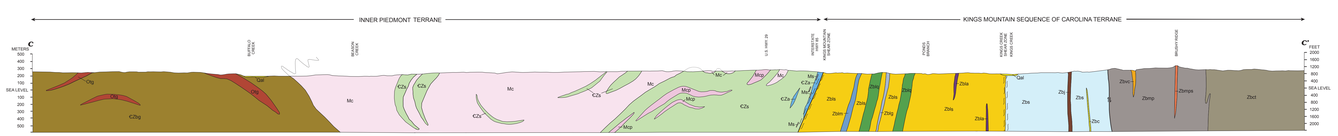
1 SHELBY
2 WACO
3 BESSEMER CITY
4 GASTONIA NORTH
5 BLACKSBURG NORTH
6 GASTONIA SOUTH
7 BLACKSBURG SOUTH
8 KINGS CREEK
9 FILBERT
10 CLOVER

NORTH CAROLINA
SOUTH CAROLINA

Geology mapped by J.Wright Horton, Jr. 1975-81 and 2001.
Assisted by S. B. Harper, 1978; Cartography by Boris J. Barrios, E. Allen Crider, Danielle Demerritt, and James Triplett



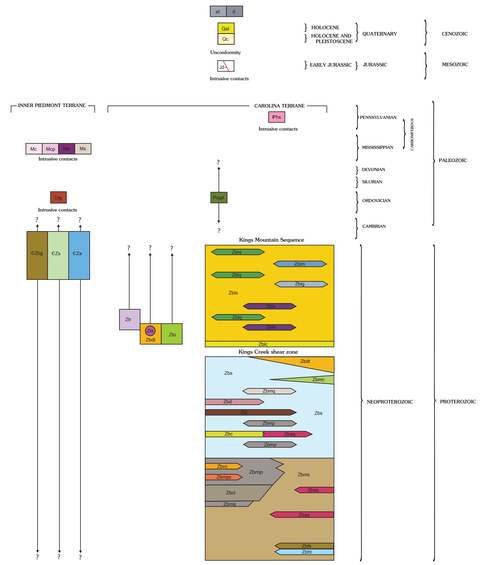




# GEOLOGIC MAP OF THE KINGS MOUNTAIN AND GROVER QUADRANGLES, CLEVELAND AND GASTON COUNTIES, NORTH CAROLINA, AND CHEROKEE AND YORK COUNTIES, SOUTH CAROLINA

By
J. Wright Horton, Jr.

2006

## CORRELATION OF MAP UNITS




## LIST OF MAP UNITS
[see accompanying Description of Map Units]

af Artificial fill
tf Mine dump

### SURFICIAL DEPOSITS

Qal Alluvium (Holocene)
Qc Colluvium (Holocene and Pleistocene)

### INTRUSIVE ROCKS

JTr Olivine diabase (Early Jurassic)
Pzhs High Schoals Granite (Pennsylvanian)
Ms Spodumene pegmatite (Mississippian)
Ma Granite pegmatite (Mississippian)

Cherryville Granite (Mississippian)
Mcp Coarse-grained granite and pegmatite
Mc Muscovite-biotite granite

Pzg Toluca Granite (Ordovician?)
Pzd Metadiorite and metagabbro (Paleozoic?)
Pzq Silicified metatrondhjemite (Neoproterozoic)
Pzr Metatrondhjemite and amphibolite gneiss (Neoproterozoic)
Pzu Metatonalite (Neoproterozoic)

### INNER PIEDMONT LAYERED METAMORPHIC ROCKS

CZa Amphibolite (Cambrian or Neoproterozoic)
CZs Muscovite schist (Cambrian or Neoproterozoic)
CZbg Muscovite-biotite gneiss (Cambrian or Neoproterozoic)

### KINGS MOUNTAIN SEQUENCE OF CAROLINA TERRANE

Blacksburg Formation (Neoproterozoic)
Zbc Chlorite phyllonite
Zbs Phyllitic metasiltstone
Zbm Marble member at Dixon Branch (informal name)
Zbg Gaffney Marble Member
Zbt Laminated micaceous quartzite
Zbh Hornblende gneiss and amphibolite

Battleground Formation (Neoproterozoic)
Zbd Metadacite and metatrondhjemite
Zbs Quartz-sericite phyllite and schist
Zbmc Crowders Creek Metaconglomerate Member
Zbmq Micaceous quartzite
Zbd Dwaytownville Metaconglomerate Member
Zbj Jumping Branch Manganiferous Member
Zbc Dixon Gap Metaconglomerate Member
Zbq Aluminous quartzite
Zbmp Mottled phyllitic metatuff
Zbsc Volcanic metaconglomerate
Zbms Siliceous metatuff
Zbsb Plagioclase-crystal metatuff
Zbms Biotite-muscovite schist
Zbsf Felsic schist and gneiss (metafelsite)
Zbhl Metavolcanic hornblende gneiss

## EXPLANATION OF MAP SYMBOLS

Contact— Approximately located; dotted where concealed. Distribution and concentration of structural symbols indicates degree of reliability

### FAULTS

**Fault** – Sense of displacement not known

U D **High-angle fault** – Dashed where inferred; dotted where concealed; U, upthrown side; D, downthrown side

### FOLDS

[Showing axial trace, direction of dip of limbs and plunge direction, where known or inferred]

$F_1$ antiform
$F_1$ synform
$F_1$ overturned antiform
$F_1$ overturned synform
$F_2$ antiform
$F_2$ synform
$F_2$ overturned antiform
$F_3$ antiform
$F_3$ synform

## PLANAR FEATURES
[Where planar and (or) linear features are combined, intersection of symbols marks point of observation]

Strike and dip of bedding

40 inclined– Where dip angle is unspecified, symbol indicates general direction of dip

vertical

Strike and dip of schistosity

40 inclined– Where dip angle is unspecified, symbol indicates general direction of dip

vertical

Strike and dip of layer-parallel foliation

40 inclined

vertical

Strike and dip of mylonitic foliation, inclined

Strike and dip of crenulation cleavage, inclined

Strike and dip of minor fault

inclined

vertical

Strike and dip of quartz vein

40 inclined

vertical

Strike and dip of early minor fold axial surface, inclined – Folds bedding or layering, but not main schistosity

Strike and dip of later minor fold axial surface, inclined – Folds main schistosity or foliation

## LINEAR FEATURES
[Where planar and (or) linear features are combined, intersection of symbols marks point of observation]

Bearing and plunge of mineral elongation

Bearing and plunge of crenulation axis

Bearing and plunge of early minor fold axis – Folds layering, but not main schistosity

Having z-shaped asymmetry (when viewed down the axis)

Having z-shaped asymmetry (when viewed don the axis)

Symmetric or having no clear asymmetry

Bearing and plunge of later minor fold axis – Folds main schistosity or foliation

Having s-shaped asymmetry (when viewed down the axis)

Having z-shaped asymmetry (when viewed down the axis)

Symmetric or having no clear asymmetry

## OTHER FEATURES

Ductile shear zone (overprint pattern)

Pegmatite swarm (overprint pattern)

Rock unit known from float

### Mines, pits, and prospects (indicating name and commodity* where known)

Quarry – Ticks point into workings

Open pit mine or quarry, ticks point into working

Sand, gravel, clay pit – Abandoned

Open pit mine or quarry

Open pit mine or quarry – Abandoned

Mine shaft – Abandoned

x Prospect (pit or occurrence)

*Commodity: Au, gold; Fe, iron; Li, lithium; Mn, manganese; Sn, tin; ba, barite; cl, clay; fl, flagstone; ky, kyanite; mb, marble; mi, mica; py, pyrite; sg, sand and gravel; sm, sillimanite

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