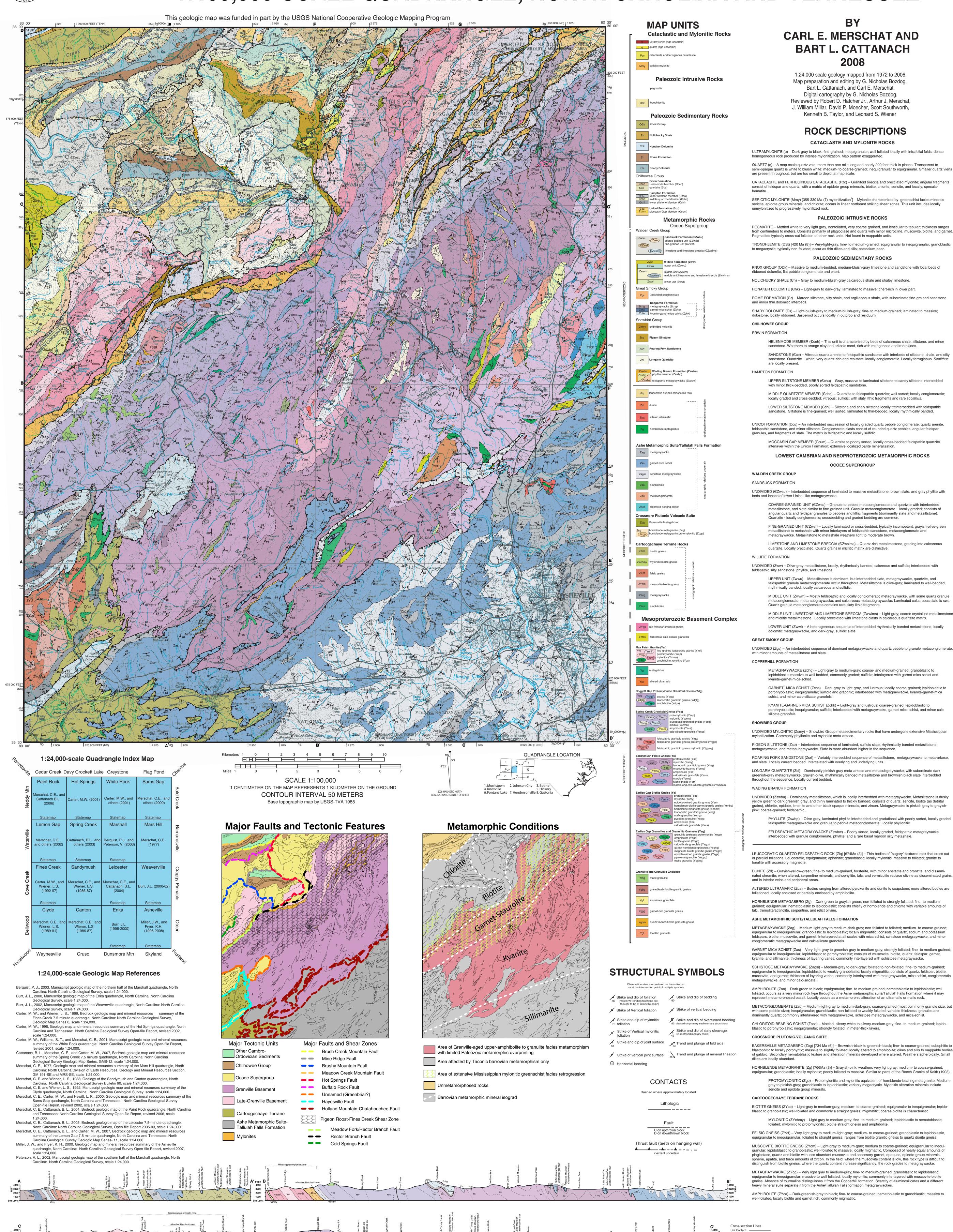


BEDROCK GEOLOGIC MAP OF THE WESTERN HALF OF THE ASHEVILLE 1:100,000-SCALE QUADRANGLE, NORTH CAROLINA AND TENNESSEE





CARL E. MERSCHAT AND BART L. CATTANACH

1:24,000 scale geology mapped from 1972 to 2006. Map preparation and editing by G. Nicholas Bozdog, Digital cartography by G. Nicholas Bozdog. Reviewed by Robert D. Hatcher Jr., Arthur J. Merschat J. William Millar, David P. Moecher, Scott Southworth,

ULTRAMYLONITE (u) - Dark-gray to black; fine-grained; inequigranular; well foliated locally with intrafolial folds; dense QUARTZ (q) – A map-scale quartz vein, more than one mile long and nearly 200 feet thick in places. Transparent to

CATACLASITE and FERRUGINOUS CATACLASITE (Pzc) - Granitoid breccia and brecciated mylonite; angular fragments consist of feldspar and quartz, with a matrix of epidote group minerals, biotite, chlorite, sericite, and locally, specular

SERICITIC MYLONITE (Mmy) [355-330 Ma (7) mylonitization²] - Mylonite characterized by greenschist facies minerals sericite, epidote group minerals, and chlorite; occurs in linear northeast striking shear zones. This unit includes locally

from centimeters to meters. Consists primarily of plagioclase and quartz with minor microcline, muscovite, biotite, and garnet. TRONDHJEMITE (DSt) [420 Ma (8)] - Very-light-gray; fine- to medium-grained; equigranular to inequigranular; granoblastic

KNOX GROUP (OEk) - Massive to medium-bedded, medium-bluish-gray limestone and sandstone with local beds of NOLICHUCKY SHALE (En) - Gray to medium-bluish-gray calcareous shale and shaley limestone.

SHADY DOLOMITE (Cs) – Light-bluish-gray to medium-bluish-gray; fine- to medium-grained; laminated to massive;

sandstone. Weathers to orange clay and arkosic sand, rich with manganese and iron oxides. SANDSTONE (Cce) – Vitreous quartz arenite to feldspathic sandstone with interbeds of siltstone, shale, and silty of calcite, diopside, epidote group minerals, and quartz. sandstone. Quartzite - white; very quartz-rich and resistant. locally conglomeratic. Locally ferruginous. Scolithus

UPPER SILTSTONE MEMBER (Echu) - Gray, massive to laminated siltstone to sandy siltstone interbedded MIDDLE QUARTZITE MEMBER (Echq) - Quartzite to feldspathic quartzite; well sorted; locally conglomeration

UNICOI FORMATION (Ecu) - An interbedded succession of locally graded quartz pebble conglomerate, quartz arenite, feldspathic sandstone, and minor siltstone. Conglomerate clasts consist of rounded quartz pebbles, angular feldspar

COARSE-GRAINED UNIT (CZwsc) - Granule to pebble metaconglomerate and quartzite with interbedded metasiltstone, and slate similar to fine-grained unit. Granule metaconglomerate – locally graded; consists of angular quartz and feldspar granules to pebbles and lithic fragments (dominantly slate and metasiltstone).

metasiltstone to metashale with minor interlayers of feldspathic sandstone, metaconglomerate and LIMESTONE AND LIMESTONE BRECCIA (¢Zwslms) – Quartz-rich metalimestone, grading into calcareous

UNDIVIDED (Zww) - Olive-gray metasiltstone, locally, rhythmically banded, calcreous and sulfidic; interbedded with

UPPER UNIT (Zwwu) - Metasiltstone is dominant, but interbedded slate, metagraywacke, quartzite, and feldspathic granule metaconglomerate occur throughout. Metasiltstone is olive-gray; laminated to well-bedded,

MIDDLE UNIT LIMESTONE AND LIMESTONE BRECCIA (Zwwlms) – Light-gray; coarse crystalline metalimestone and micritic metalimestone. Locally brecciated with limestone clasts in calcareous quartzite matrix. BIOTITE GNEISS (Ye) [1270 Ma (4)] - Heterogeneous unit of biotite gneiss, biotite granitic gneiss, and layered LOWER UNIT (Zwwl) - A heterogeneous sequence of interbedded rhythmically banded metasiltstone, locally

UNDIVIDED (Zgs) - An interbedded sequence of dominant metagraywacke and quartz pebble to granule metaconglomerate,

METAGRAYWACKE (Zchg) - Light-gray to medium-gray; coarse- and medium-grained: granoblastic to lepidoblastic; massive to well bedded, commonly graded; sulfidic; interlayered with garnet-mica schist and

GARNET¹-MICA SCHIST (Zchs) – Dark-gray to light-gray, and lustrous; locally coarse-grained; lepidoblabtic to porphryoblastic; inequigranular; sulfidic and graphitic; interbedded with metagraywacke, kyanite-garnet-mica

KYANITE-GARNET-MICA SCHIST (Zchk) - Light-gray and lustrous; coarse-grained; lepidoblastic to porphryoblastic; inequigranular; sulfidic; interbedded with metagraywacke, garnet-mica schist, and minor calc-

UNDIVIDED MYLONITIC (Zsmy) - Snowbird Group metasedimentary rocks that have undergone extensive Mississippiar

PIGEON SILTSTONE (Zsp) - Interbedded sequence of laminated, sulfidic slate, rhythmically banded metasiltstone ROARING FORK SANDSTONE (Zsrf) - Variably interbedded sequence of metasiltstone, metagraywacke to meta-arkose,

UNDIVIDED (Zswbu) - Dominantly metasiltstone, which is locally interbedded with metagraywacke. Metasiltstone is dusky

yellow green to dark greenish gray, and thinly laminated to thickly banded; consists of quartz, sericite, biotite (as detrital grains), chlorite, epidote, ilmenite and other black opaque minerals, and zircon. Metagraywacke is pinkish gray to grayish-

feldspathic metagraywacke and granule to pebble metaconglomerate. Locally phyllonitic. FELDSPATHIC METAGRAYWACKE (Zswbw) – Poorly sorted, locally graded, feldspathic metagraywacke

LEUCOCRATIC QUARTZO-FELDSPATHIC ROCK (Zlq) [674Ma (3)] - Thin bodies of "sugary"-textured rock that cross cut or parallel foliations. Leucocratic, equigranular; aphanitic; granoblastic; locally mylonitic; massive to foliated; granite to

DUNITE (Zd) - Grayish-yellow-green; fine- to medium-grained, forsterite, with minor enstatite and bronzite, and dissemi-BIOTITE GNEISS (Yegb) - Medium-gray; equigranular; lepidoblastic to granoblastic; well-foliated to straight gneiss nated chromite; when altered, serpentine minerals, anthophyllite, talc, and vermiculite replace olivine as disseminated grains, (s-tectonite); biotite gneiss to layered biotite granitic gneiss with interlayers of amphibolite. Occurs throughout the ALTERED ULTRAMAFIC (Zua) – Bodies ranging from altered pyroxenite and dunite to soapstone; more altered bodies are

HORNBLENDE METAGABBRO (Zg) - Dark-green to grayish-green; non-foliated to strongly foliated; fine- to mediumgrained; equigranular; nematoblastic to lepidoblastic; consists chiefly of hornblende and chlorite with variable amounts of

METAGRAYWACKE (Zag) - Medium-light-gray to medium-dark-gray; non-foliated to foliated; medium- to coarse-grained equigranular to inequigranular; granoblastic to lepidoblastic; locally migmatitic; consists of quartz, sodium and potassium feldspars, biotite, muscovite, and garnet. Interlayered at all scales with mica schist, schistose metagraywacke, and minor

equigranular to inequigranular; lepidoblastic to porphyroblastic; consists of muscovite, biotite, quartz, feldspar, garnet, kyanite, and sillimanite; thickness of layering varies; commonly interlayered with schistose metagraywacke. SCHISTOSE METAGRAYWACKE (Zagsi) – Medium-gray to dark-gray; foliated to non-foliated; fine- to medium-grained; equigranular to inequigranular; lepidoblastic to weakly granoblastic; locally migmatitic; consists of quartz, feldspar, biotite, muscovite, and garnet; thickness of layering varies; commonly interlayered with metagraywacke, mica schist, conglomeratic

AMPHIBOLITE (Zaa) – Dark-green to black; equigranular; fine- to medium-grained; nematoblastic to lepidoblastic; well foliated; occurs as a very minor rock type throughout the Ashe metamorphic suite/Tallulah Falls Formation where it may represent metamorphosed basalt. Locally occurs as a metamorphic alteration of an ultramafic or mafic rock. METACONGLOMERATE (Zac) - Medium-light-gray to medium-dark-gray; coarse-grained (most commonly granule size, but with some pebble size); inequigranular; granoblastic; non-foliated to weakly foliated; variable thickness; granules are dominantly quartz; commonly interlayered with metagraywacke, schistose metagraywacke, and mica-schist. CHLORITOID-BEARING SCHIST (Zasc) - Mottled, silvery-white to silvery-medium-gray; fine- to medium-grained; lepido-

blastophitic to locally porphyritic; massive to slightly foliated; locally altered to amphibolite; dikes and sills to mappable bodies equigranular; granoblastic; weakly foliated to foliated; medium layered to massive. of gabbro. Secondary nematoblastic texture and alteration minerals developed where altered. Weathers spheroidally. Small HORNBLENDE METAGRANITE (Zg) [766Ma (3)] - Grayish-pink; weathers very light gray; medium- to coarse-grained;

PROTOMYLONITIC (Zgp) – Protomylonitic and mylonitic equivalent of hornblende-bearing metagranite. Medium
1. Mineral adjectives are arranged in order of increasing abundance for all descriptions 2. Numbers in parentheses correspond to sources in the Geochronology list. gray to pinkish-gray; granoblastic to lepidoblastic; variably megacrystic. Mylonitic alteration minerals include

blastic to granoblastic; well-foliated and commonly a straight gneiss; migmatitic; coarse biotite is characteristic. MYLONITIC (ZYcbmy) – Light-gray to medium-gray; fine- to medium-grained; lepidoblastic to nematoblastic;

FELSIC GNEISS (ZYcf) - Very light gray to medium-light-gray; medium- to coarse-grained; granoblastic to lepidoblastic equigranular to inequigranular; foliated to straight gneiss; ranges from biotite granitic gneiss to quartz diorite gneiss. MUSCOVITE BIOTITE GNEISS (ZYcm) - Light-gray to medium-gray; medium to coarse-grained; equigranular to inequi granular; lepidoblastic to granoblastic; well-foliated to massive; locally migmatitic. Composed of nearly equal amounts of plagioclase, guartz and biotite with less abundant muscovite and accessory garnet, opaques, epidote-group minerals, distinguish from biotite gneiss; where the quartz content increase significantly, the rock grades to metagraywacke. METAGRAYWACKE (ZYcg) - Very light gray to medium-gray; fine- to medium-grained; granoblastic to lepidoblastic; equigranular to inequigranular; massive to well foliated, locally mylonitic; commonly interlayered with muscovite-biotite gneiss. Absence of tourmaline distinguishes it from the Copperhill formation. Scarcity of aluminosilicates and a different

AMPHIBOLITE (ZYca) - Dark-greenish-gray to black; fine- to coarse-grained; nematoblastic to granoblastic; massive to

FERRIFEROUS CALC-SILICATE GRANOFELS (ZYfcs) – Very dusky red; granoblastic to megacrystic; massive to thinly foliated, locally mylonitized. Consists of magnetite, garnet, epidote, hornblende, and quartz.

GRANITE (Ym) [1087-1019 Ma (1,2,3)] - Mottled, pale-pink and pale-green; coarse-grained; equigranular to slightly megacrystic; granoblastic; weakly foliated to massive; green coloration of plagioclase is a result of saussuritization;

MESOPROTEROZOIC BASEMENT COMPLEX

RED FELDSPAR GRANITOID GNEISS (ZYqq) - Gravish-pink to moderate-red; equigranular; granoblastic; locally

mylonitic; poorly foliated to massive. Epidotization is widespread; epidote and specular hematite commonly fill

thin zones of mylonitic rock occur throughout and are characterized by increased sericite, epidote group minerals. and chlorite. Locally, amphibolite xenoliths occur at all scales. PROTOMYLONITIC (Ymp) [1047 Ma (1,2)] - Mississippian (7) protomylonitization; mottled, with orangepink megacrysts of potassium feldpar and moderate-yellow-green saussuritized plagiclase; megacrystic

(potassium feldspar megacrysts as large as three inches in length); protomylonitic to locally strongly mylonitic; composition rang3es from granitic to dominantly granodioritic. Blue quartz grains are common. Sericite content increases with mylonitization. MYLONITIC (Ymmy) - Mississippian (7) mylonitization; mottled with moderate-orange-pink megacrysts of potassium feldspar and moderate-vellow-green sassuritization of plagioclase; inequigranular; mylonitic;

varies from granitic to dominantly granodioritic. Mylonitic alteration minerals include sericite and epidote

group minerals. This unit contains unmylonitized Max Patch granite and mylonitized amphibolite xenoliths. FINE-GRAINED LEUCOCRATIC GRANITE (Ymfl) – Light-gray to white, mottled, with pale-pink to moderate-red and pale-green; fine-grained; massive to foliated; locally mylonitic. $AMPHIBOLITE\ XENOLITHS\ (Yax)-Mottled,\ greenish-black;\ nematoblastic\ to\ granoblastic,\ locally\ mylonitic;$ foliated; xenolithic lenses and pods. Original plagioclase is thoroughly retrograded to epidote.

METAGABBRO (Yg) [1061 Ma (1)] - Brownish-black; sub-ophitic to blastophitic modified to nematoblastic and lepidoblastic, locally mylonitic and megacrystic; locally altered to amphibolite and biotite-chlorite schist; weathers spheroidally; clinopyroxene-, hypersthene-, and olivine- bearing. Locally porphyritic, with plagioclase phenocrysts. ALTERED ULTRAMAFIC (Yua) - Small discontinuous lenses and pods of soapstone throughout, talc-bearing amphibolite, altered pyroxenite, and altered dunite.

DOGGETT GAP PROTOMYLONITIC GRANITOID GNEISS PROTOMYLONITIC GRANITOID GNEISS (Ydg) [1071 Ma (2,3)] - Medium light gray; biotite tonalite to biotite

granite feldspar porphyroclasts in a biotite-rich matrix; inequigranular; lepidoblastic; megacrystic; foliated to weakly ated; protomylonitic to mylonitic. Age of mylonitization is uncertian.

COARSE (Ydgc) - Light gray; biotite granitic gneiss with abundant large (> 3 cm) feldspar porphyroclasts within a biotite-rich matrix; inequigranular; lepidoblastic; megacrystic; weakly foliated to foliated; protomylonitic to mylonitic. Age of mylonitization is Mississippian.

AMPHIBOLITE (Ydga) - Fine- to coarse-grained; nematoblastic to lepidoblastic; well-foliated; interlayered with amphibolite and thin layers of biotite-rich gneiss and schist. **SPRING CREEK GRANITOID GNEISS**

LEUCOCRATIC GRANITOID GNEISS (Ydglg) - Light gray; leucocratic, feldspathic, massive to foliated.

GRANITOID GNEISS (Ysc) [1174-1136 Ma (1,2,3,10)] - Heterogeneous metamorphosed orthogneiss dominated by biotite granitic gneiss; interlayered with biotite granodioritic gneiss, biotite tonalitic gneiss, amphibolite, biotite gneiss and biotite schist. Granitoid rock types are light-gray, mottled with pinkish-gray to pale-reddish-brown; medium- to coarse-grained; equigranular to inequigranular; granoblastic to lepidoblastic, massive to foliated; locally mylonitic.

PROTOMYLONITIC (Yscp) – Spring Creek Granitoid Gneiss that has undergone Mississippian (7) protomylonitization; granoblastic to lepidoblastic; megacrystic; protomylonitic foliation is defined by

mylonitization. Common mylonitic alteration minerals are sericite, epidote group minerals, and chlorite. Locally interlayered with amphibolite and unmylonitized granitoid gneiss. LEUCOCRATIC GRANITOID GNEISS (Ysclq) - Leucocratic, feldspathic, massive to foliated granitoid; locally

MYLONITIC (Yscmy) – Spring Creek Granitoid Gneiss that has undergone Mississippian (7)

MARBLE (Yscmb) - Light-gray to pinkish-gray; fine- to coarse-grained; equigranular; granoblastic; massive; consists AMPHIBOLITE (Ysca) - Dark-greenish-gray; fine- to coarse-grained; nematoblastic to lepidoblastic; well-foliated to mylonitic; hornblende, biotite, and plagioclase content vary.

CALC-SILICATE GRANOFELS (Ysccs) - Very light gray with diagnostic dark-yellowish-orange splotches on weathered surfaces; granoblastic, weakly foliated; epidosite locally present. FELDSPATHIC GRANITOID GNEISS

FELDSPATHIC GRANITOID GNEISS (Yfgg) [1171 Ma (3)] - Medium light gray, moltled with pink to light-greenish gray; characterized by the lack of accessory minerals and brittle deformation, but distinguished in the field by its tectonically derived alteration to red potassic feldspars and green saussuritized plagioclase. Interlayered with and intruded by mafic rocks.

PROTOMYLONITIC (Yfggp) - Medium-light-gray, mottled with pale-pink to light-greenish-gray; coarsegrained megacrysts (>2 to 3 cm); weakly foliated to foliated; inequigranular; protomylonitic to locally mylonitic. Age of mylonitization is Mississippian.

MYLONITIC (Yfggmy) - Medium-gray, mottled, pink to yellow-green; equigranular to inequigranular; granoblastic to lepidoblastic; finely megacrystic; foliated; mylonitic to protomylonitic, locally strongly mylonitic. Age of mylonitization is Mississippian. SANDYMUSH FELSIC GNEISS FELSIC GNEISS (Ys) - Thick, monotonous, layered sequence dominated by biotite granitic gneiss to quartz dioritic

gneiss. Includes interlayers of biotite schist and amphibolite. Pinkish gray; granoblastic to lepidoblastic, locally

protomylonitic; well-foliated and commonly a straight gneiss (s-tectonite). PROTOMYLONITIC (Ysp) – Mississippian (7) protomylonitization; granoblastic to lepidoblastic; megacrystic. Protomylonitic foliation is defined by greenschist facies minerals. MYLONITIC (Ysmy) - Inequigranular; granoblastic to lepidoblastic; mylonitic; foliated. Felsic layers range

from granitic to tonalitic. Mississipian (7) mylonitic alteration minerals include sericite and epidote group MAFIC GNEISS (Ysm) - Heterogeneous unit dominated by layered rocks rich in hornblende and biotite interlayered with layered biotite granitic gneiss. Mafic rocks vary from schistose to gneissic and are locally straight gneisses (s-tectonites) to schistose; interlayered on all scales; locally migmatitic.

LEUCOCRATIC GRANITOID GNEISS (Yslg) - Leucocratic, feldspathic, massive to foliated granitoid; locally CALC-SILICATE GRANOFELS (Yscs) - Very light gray to greenish-gray; medium- to coarse-grained; granoblastic; equigranular; massive to poorly foliated; thin-to medium-layered to podiform; commonly diopside and epidote

MUSCOVITE-BEARING GNEISS (Ysmu) - Pale-reddish-brown to dusky-red in saprolite; fine-grained; lepidoblastic;

bearing; characterized by yellowish-brown limonite spots resulting from rapid weathering of diopside. AMPHIBOLITE (Ysa) - Dark-green; fine- to coarse-grained; equigranular; nematoblastic to granoblastic; well-foliated and commonly a straight gneiss (s-tectonite). Interlayered with other rock types of the Sandymush Felsic Gneiss. MARBLE (Ysmm) - Very light gray; medium- to coarse-grained; calcareous to dolomitic marble. Accessory palegreen rounded diopside, epidote, and opaques. Occurs as small lenses. MARBLE AND CALC-SILICATE GRANOFELS (Ysmacs) – This map unit contains both the marble and calc-silicate

rocks described above. The two rocks appear to be gradational from calcite dominated to quartz-feldapar dominated.

biotite granitic gneiss, interlayered with amphibolite, calc-silicate granofels, altered ultramafic, granulites, rare marble, and other less common rock types. Ranges in composition from biotite granitic gneiss to quartz diorite gneiss. Very similar to portions of the Sandymush Felsic Gneiss and the Earlies Gap Granulitic Gneiss. Distinctive "wavy" to anastamosing appearance of some layers. The gneisses are lepidoblastic to equigranular granoblastic; locally mylonitic, protomylonitic and migmatitic; well-foliated and commonly a straight gneiss. PROTOMYLONITIC (Yep) – Medium-light-gray; granoblastic to lepidoblastic; megacrystic; heterogeneous

granitoid protomylonite. Locally biotite rich. Age of mylonitization is uncertain. MYLONITIC (Yemy) - Medium-gray; inequigranular; granoblastic to lepidoblastic, mylonitic; megacrystic; granitic to tonalitic. Age of mylonitization is Mesoproterozoic

EPIDOTE VEINED GRANITIC GNEISS (Yee) - Mottled, pink and white; massive to poorly foliated granodiorite with no accessory minerals. Epidote occurs as thin veins or fracture fillings. HORNBLENDE-BIOTITE-GARNET GRANITIC GNEISS (Yehbg) - Medium- to dark-gray; poorly foliated to wellfoliated; consists of quartz, feldspar, garnet, biotite, and hornblende. HORNBLENDE-MAGNETITE GNEISS (Yehma) - Light-gray to moderate-pink; massive to poorly foliated; quartzofeldspathic gneiss; accessory magnetite and minor hornblende.

MAFIC GRANULITE (Yemg) - Dark-greenish-gray; mafic rock of variable composition and appearance, from amphibolite to biotite-hornblende. Layers and bodies range in thickness from centimeters to meters to mappable PYROXENE-GRANULITE (Yepg) - Consists of mafic and felsic phases. Color varies with protolith; coarse-grained;

granoblastic with clots of hornblende, hypersthene, and diopside throughout the matrix; massive to well-foliated and

LEUCOCRATIC GRANITOID GNEISS (Yelg) – Leucocratic, feldspathic, massive to foliated granitoid.

AMPHIBOLITE (Yea) - Dark-greenish-gray; fine- to coarse-grained; nematoblastic to granoblastic to lepidoblastic and commonly a straight gneiss (s-tectonite), variable thickness; locally diopsidic. Interlayered with other rock types of the Earlies Gap Biotite Gneiss; derived from metamorphosed mafic igneous rock or retrograded mafic metamor-

CALC-SILICATE GRANOFELS (Yecs) – Loeucocratic; equigranular; granoblastic; weakly foliated, thin layered to podiform bodies; interlayered with amphibolite and other rock types. Characterized by yellowish brown limonite spots resulting from preferential weathering of diopside.

EARLIES GAP GRANULITES AND GRANULITIC GNEISS GRANULITIC GNEISSES (Yeg) [1200-1260 Ma (5, 9, 10)] - Mafic and felsic rock types interlayered and gradational at all scales. Low in quartz and contains almost no muscovite or aluminum silicates. Mafic layers are equigranular; nematoblastic to granoblastic; well-foliated and commonly a straight gneiss (s-tectonite); vary in composition

between gabbro and diorite. Felsic layers are equigranular; granoblastic to lepidoblastic; well-foliated to massive; vary from granite to granodiorite; commonly contain clinopyroxene-orthopyroxene. Locally, protomylonitic and PROTOMYLONITIC (Yegp) – Dark-gray; megacrystic to weakly megacrystic. Protomylonitic quartz monzonite. Mylonitization is Mesoproterozoic in age.

AMPHIBOLITE (Yega) – Dark-greenish-gray to black; fine- to coarse-grained; nematoblastic to granoblastic to lepidoblastic and commonly a straight gneiss (s-tectonite); variable thickness; locally diopsidic. Interlayered with other rock types of the Earlies Gap granulitic gneisses; derived from retrograded igneous or metamorphic mafic

Earlies Gap granulitic gneiss. CALC-SILICATE GRANOFELS (Yegcs) – Very light gray; granoblastic; weakly foliated; typically consists of quartz, diopside, epidote group minerals, plagioclase, and garnet. Yellowish brown limonite formed during weathering of diopside is characteristic and diagnostic. GARNET-HORNBLENDE GRANOFELS (Yeghg) - Grayish-black to black with dusky-red garnets; granoblastic,

coarse- to very coarse-grained; massive to weakly foliated. MAGNETITE BIOTITE GNEISS (Yegm) - Medium-gray; poorly foliated to foliated; quartz monzonite. Magnetite occurs as euhedral grains in the guartzo-feldspathic layers. EPIDOTE VEINED GRANITIC GNEISS (Yege) – Mottled pink and white; massive to poorly foliated granodiorite. Epidote occurs as thin veins or fracture fillings.

PYROXENE GRANULITE (Yegpg) - Grayish-orange-pink to pale-brown; weakly foliated to massive; granoblastic to nematoblastic; diagnostic hypersthene and diopside; interlayered and gradational with amphibolite and mafic MAFIC GRANULITE (Yegmg) - Includes the following rock types: amphibolite, diopside-bearing calc-silicate granofels, and clinopyroxene-orthopyroxene bearing biotite-hornblende gneiss. Larger bodies may show a progres-

sion from massive granoblastic mafic granulite at the center to nematoblastic amphibolite at their margins. **GRANULITE AND GRANULITIC GNEISSES** MAFIC GRANULITE (Ymg) - Medium-gray; medium- to coarse-grained; granoblastic; massive to weakly layered; diorite to quartz diorite to tonalite; hypersthene bearing. Commonly retrogressed to nematoblastic, foliated amphibo-

GRANOBLASTIC BIOTITE GRANITIC GNEISS (Ygbg) - Light-gray; granoblastic, massive; locally mylonitic. Characterized by biotite and amphibole aggregates within the more felsic groundmass.

ALUMINOUS GRANOFELS (Ygf) - Medium-light-gray, mottled, moderate-brown when weathered; inequigranular; granoblastic to lepidoblastic; weakly foliated; massive; garnet-bearing and sillimanite-bearing. GARNET-RICH GRANULITE GNEISS (Yggg) – Light-gray; equigranular; granoblastic, locally mylonitic; weakly foliated to foliated; garnet, up to 20 percent is characteristically present in most folia. BAKERSVILLE METAGABBRO (Zbg) [734 Ma (6)] – Brownish-black to greenish-black; fine- to coarse-grained; subophitic to QUARTZ MONZODIORITIC GRANULITE GNEISS (Ygqm) – Pale-brown with grayish-orange-pink mottling; TONALITIC GRANULITE (Ygt) – Light-gray to dark-greenish-gray; equigranular; granoblastic, locally mylonitic;

weakly foliated to foliated; medium layered to massive.

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Detailed 1:24,000 scale structural symbology, geochemistry, and thin section analyses are available at the NCGS Asheville Regional Office: http://www.geology.enr.state.nc.us/. Map is also available in Geographic Information System (GIS) format.