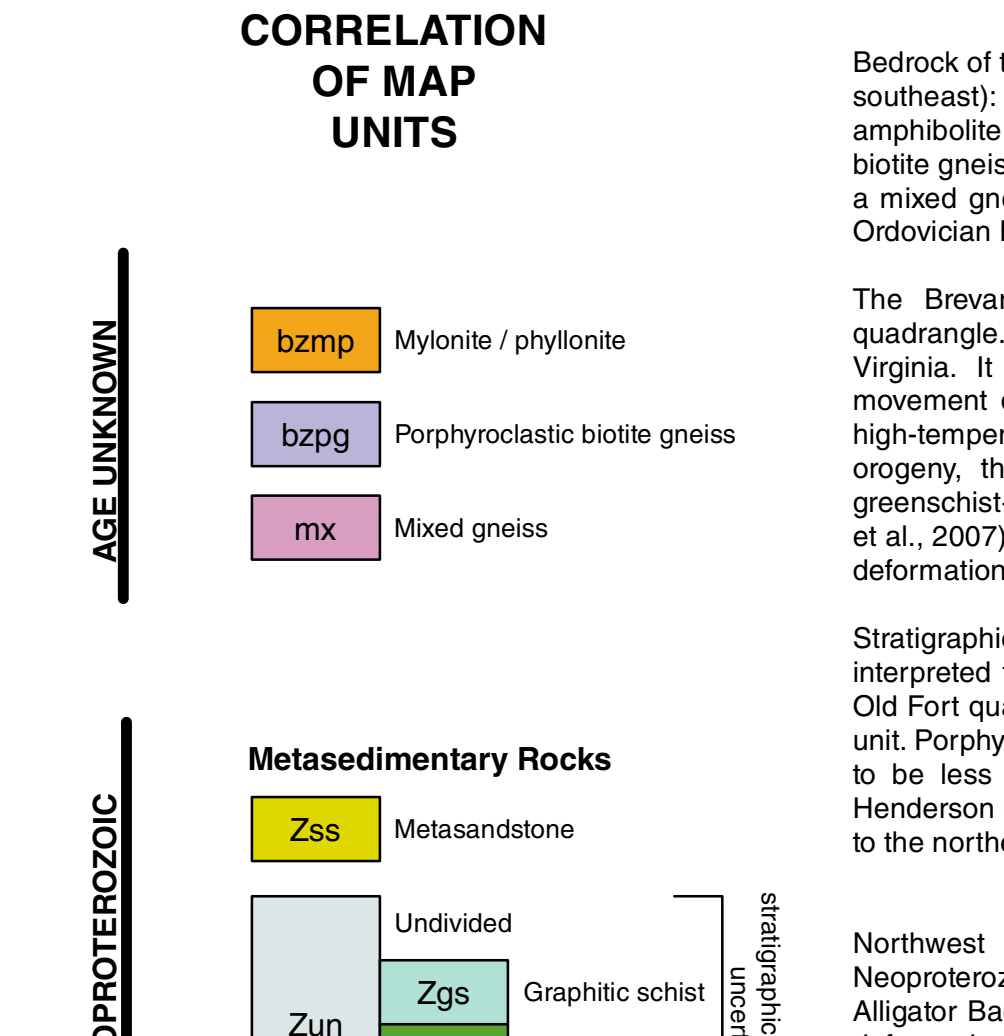


CORRELATION OF MAP UNITS



Metasedimentary Rocks

INTRODUCTION

The Old Fort 75-minute quadrangle lies in western North Carolina in portions of McDowell and Yancey counties. The town of Old Fort is the largest community on the quadrangle. Much of the quadrangle north of the town of Old Fort lies within Pisgah National Forest owned by the U.S. Forest Service.

WHOLE ROCK ICP ANALYSIS¹ OF SELECTED SAMPLES

SAMPLE ¹	BC79	NB73	NB43	NB135	NB105	NB278	NB168	BC255	BC247	NB21
COORDINATES ²	224.781N 322.496E	224.199N 322.925E	220.155N 318.886E	220.155N 318.886E	219.166N 323.896E	219.006N 323.896E	219.727N 322.586E	214.214N 303.311E	215.927N 319.819E	213.970N 318.819E
ROCK TYPE	metaschist	metaschist	metaschist	metaschist	metaschist	metaschist	metaschist	metaschist	metaschist	metaschist
MAP UNIT	Zun	Zun	Zun	Zun	Zss	bzpg	bzpg	bzpg	bzpg	bzpg

MAJOR OXIDES IN PERCENT										
SiO ₂										
Al ₂ O ₃										
Fe ₂ O ₃										
MgO										
CaO										
Na ₂ O										
K ₂ O										
TiO ₂										
P ₂ O ₅										
MnO										
Cr ₂ O ₃										
LOI*										
SUM ¹										

ELEMENTS IN PPM ²										
Ba										
Be										
Bi										
Br										
Ca										
Cd										
Ce										
Co										
Cu										
Ga										
Hf										
Hg										
In										
K										
Li										
Mn										
Mo										
Ni										
Os										
Pb										
Pt										
Rb										
Sr										
Sn										
Su										
Ta										
Tb										
Tm										
Tl										
U										
V										
W										
Xe										
Y										
Zn										
Zr										

AWAITING ANALYTICAL RESULTS

REFERENCES

Almendinger, R.W., Carlson, N., and Fisher, D.: 2002, Structural geology algorithms Vectors and tensors in structural geology. Cambridge University Press, 399 pp.



DESCRIPTION OF MAP UNITS¹

bzmp / phyllonite — Intensely deformed rocks with unknown protoliths. Tan to light-gray to dark-gray to light-olive-gray to greenish-gray; fine- to coarse-grained; lepidoblastic to porphyroblastic, strongly foliated, locally ultramylonitic, locally brecciated, consists of sericite, quartz, feldspar, biotite, chlorite, and accessory garnet, graphite, magnetite, and opaque minerals. Lenticular muscovite aggregate porphyroblasts tabular in the mylonite foliation planes impart a distinctive 'fish scale' or 'tuffet' appearance to phyllonites. Locally interlayered with porphyroblastic biotite gneiss, granitic orthogneiss, and felsic gneiss.

Porphyroblastic biotite gneiss — Heterogeneous mix of porphyroblastic and porphyroblastic, mylonitic biotite gneiss, quartz-feldspathic gneiss, granitic orthogneiss, felsic gneiss, phyllonite, mylonite, and amphibolite, with minor biotite metawacke and metasediments. Protoliths unknown although tentatively correlated to Mesoproterozoic gneisses mapped along strike to the northwest. Biotite gneiss is typically light-gray to grayish-black, well foliated, locally protomylonitic to ultramylonitic, medium- to coarse-grained, inequigranular, 2-10 mm sized porphyroblasts and/or porphyroclasts; lepidoblastic, consists of quartz, plagioclase, biotite, potassium feldspar, muscovite, minor epidote, garnet, and titanite.

Mixed Gneiss — Heterogeneous unit consisting of a biotite gneiss of unknown affinity, Henderson gneiss, granitic orthogneiss, and mylonite.

Metasedimentary Rocks

Metasandstone — Interlayered metamorphosed sandstones with compositions including arkosic arenite, biotite metawacke, and quartzite. Tan to medium-gray to light-green; fine- to medium-grained, foliated to locally mylonitic; inequigranular to inequigranular; consists of quartz, feldspar, muscovite, biotite, and minor accessory minerals; rotatably does not contain schist, amphibolite, or garnet.

Undivided — Heterogeneous unit consisting of interlayered layers and lenses of laterally and vertically grading sedimentary and mafic volcanic rocks metamorphosed to kyanite- and sillimanite-grade. Rock types include metabasite, arkosic meta-arenite, schist, graphitic schist, mylonite, phyllonite, biotite gneiss, and amphibolite. Thickness of layering ranges from centimeters to meters.

Biotite metawacke — Medium-light-gray to medium-dark-gray; medium- to coarse-grained; foliated; protomylonitic to mylonitic; inequigranular to inequigranular; granoblastic to lepidoblastic; locally migmatitic, consists of quartz, plagioclase feldspar, biotite, muscovite, garnet, epidote, sillimanite and/or kyanite, staurolite, chlorite, opaque minerals, trace potassium feldspar and zircon; thickness of layering ranges from decimeters to meters.

Muscovite metawacke — Light-tan to light-gray; fine- to medium-grained; foliated; protomylonitic to mylonitic; granoblastic to lepidoblastic; consists of quartz, plagioclase feldspar, muscovite > biotite, sericite, chlorite, and with minor amounts of garnet, potassium feldspar, titanite, apatite, and other accessory minerals; locally has millimeter scale 'pin-striped' fabric.

Arkosic meta-arenite — Tan to medium-light-gray to gray; medium-grained, equigranular to inequigranular, foliated; consists of quartz, feldspar, with minor amounts of muscovite, biotite, and other accessory minerals.

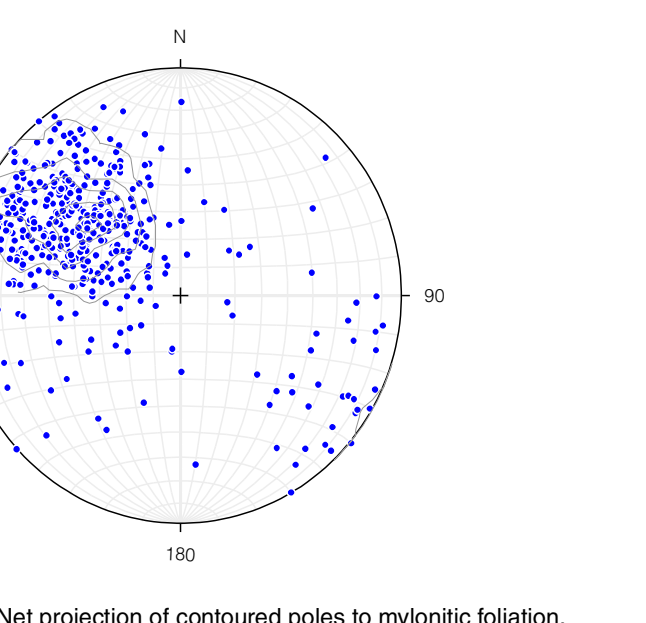
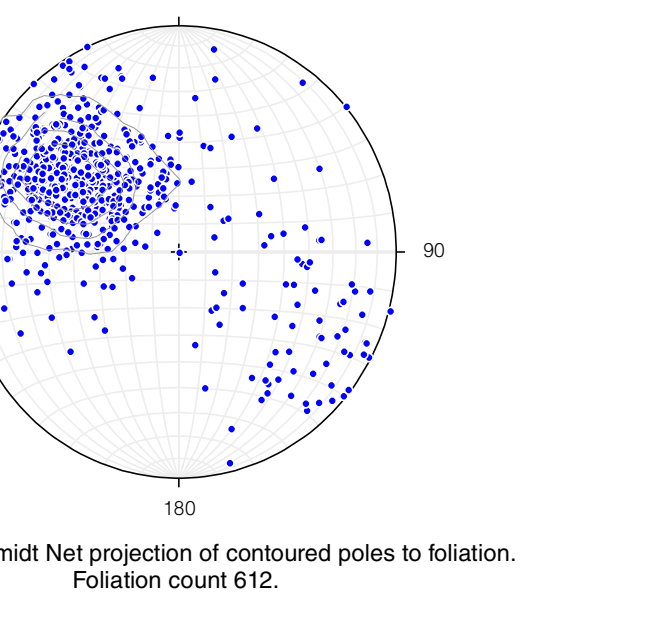
Schist — Garnet-mica schist, muscovite schist, muscovite-biotite schist, very light-gray to greenish-gray to medium-gray; medium- to coarse-grained; well foliated and locally mylonitic; inequigranular; lepidoblastic; consists of muscovite, biotite, garnet, quartz, plagioclase feldspar, potassium feldspar, and minor accessory minerals; locally contains chlorite, staurolite, tourmaline, kyanite, graphite, and trace zircon.

Graphitic schist — Dark-gray to greenish-gray to medium-gray; fine- to medium-grained; well foliated to mylonitic; inequigranular to inequigranular; lepidoblastic to porphyroblastic; consists of muscovite, biotite, garnet, sericite, quartz, graphite, feldspar, chlorite, pyrite, and accessory minerals; interlayered with lesser amounts of metaarkose, metawacke, garnet-mica schist, and phyllite.

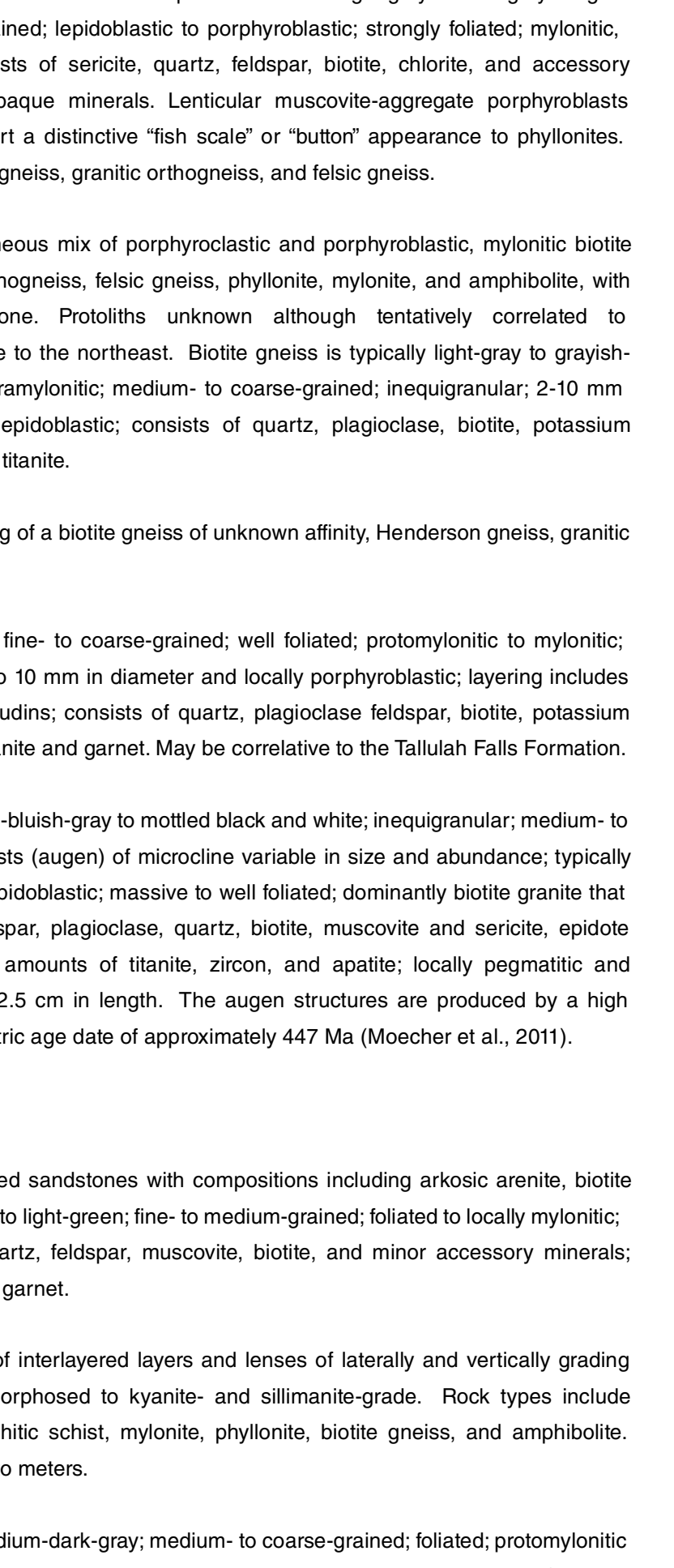
Amphibolite — Dark-green to black; fine- to coarse-grained; weakly to strongly foliated; equigranular; granoblastic to nematoblastic; consists of hornblende, plagioclase feldspar, epidote group minerals, quartz, garnet, chlorite, relic pyroxene, titanite, magnetite, and opaque minerals. Can occur as a very minor rock type throughout the other map units, where it may represent a metamorphosed volcanic rock.

¹Mineral abundances are listed in decreasing order of abundance based upon visual estimates of hand samples and thin sections.

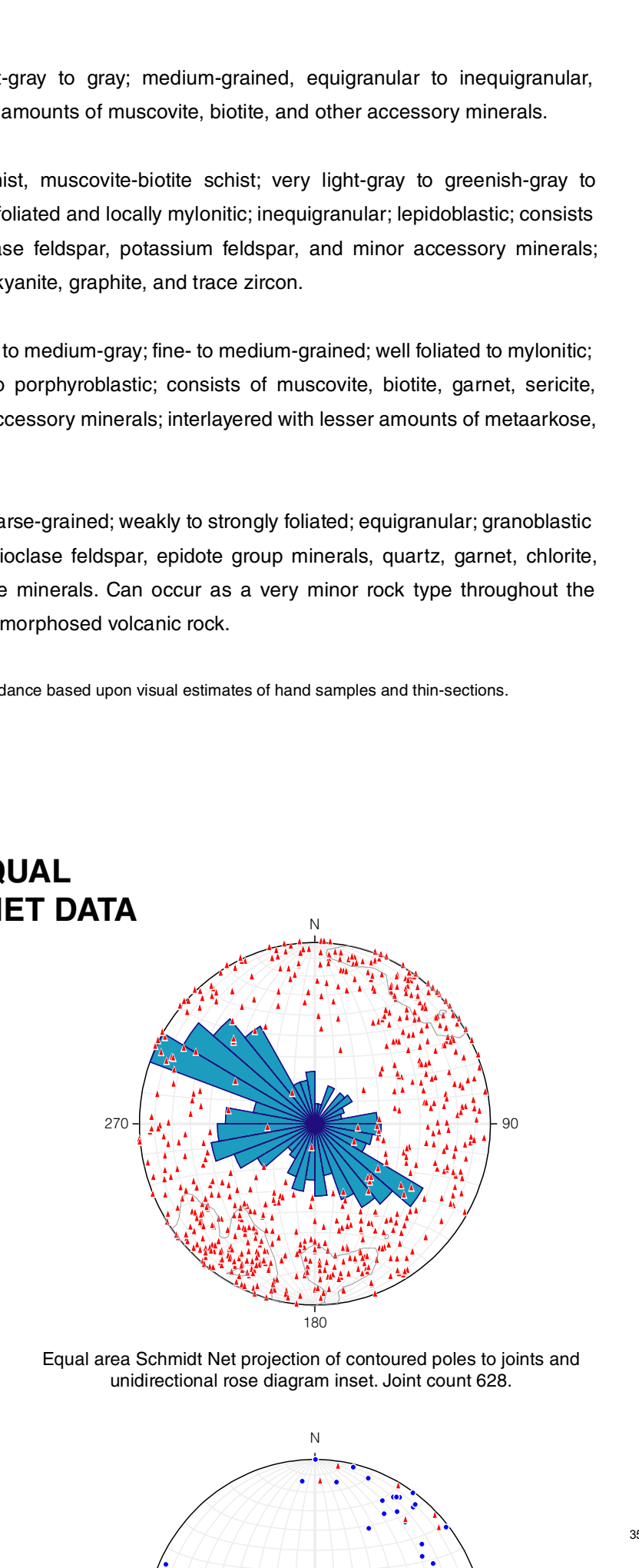
SCHMIDT EQUAL AREA STEREONET DATA



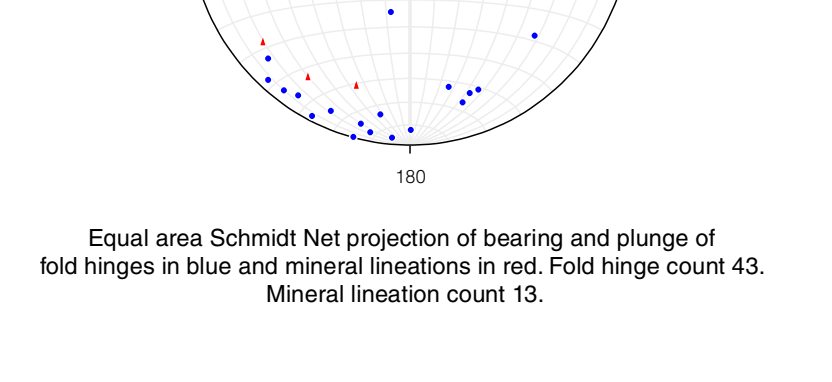
EXPLANATION OF MAP SYMBOLS



METAMORPHIC AND TECTONIC CONDITIONS



TRAVERSE MAP



REFERENCES

Almendinger, R.W., Carlson, N., and Fisher, D.: 2002, Structural geology algorithms Vectors and tensors in structural geology. Cambridge University Press, 399 pp.

Bedrock Geologic Map of the Old Fort 75-minute Quadrangle, McDowell and Yancey Counties, North Carolina

By
Bart L. Cattanauch, G. Nicholas Bozdog, Sierra J. Isard, and Richard M. Wooten

Geology mapped from July 2018 to June 2019.
Map preparation, digital cartography and editing by G. Nicholas Bozdog, Bart L. Cattanauch, and Sierra J. Isard
2019

This is an Open-File Map. It has been reviewed internally for conformity with North Carolina Geological Survey mapping standards and with the North American Stratigraphic Code. Further revisions or corrections to this Open File map may occur. Some station data omitted from map to improve readability. Please contact the North Carolina Geological Survey for complete observation and thin-section data.