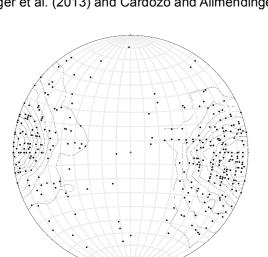
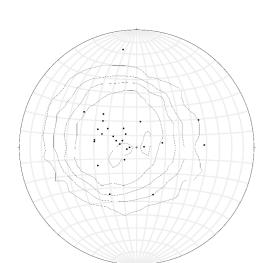
Equal-Area Schmidt Net Projections and Rose Diagram

Kenneth B. Taylor, State Geologist

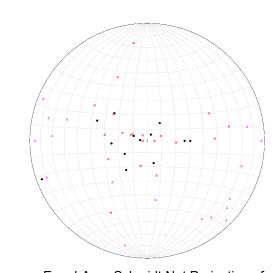
Plots and calculations created using Stereonet v. 8.6.0 based on Allmendinger et al. (2013) and Cardozo and Allmendinger (2013).



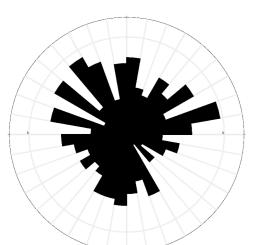
Equal-Area Schmidt Net Projection of Contoured Poles to Metamorphic and Shear Foliations Contour Interval = 2 sigma N = 383



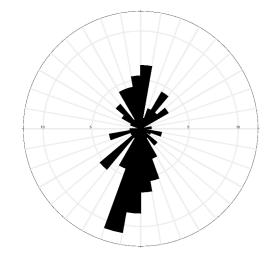
Equal-Area Schmidt Net Projection of Contoured Mineral Lineations and Mineral Stretching Lineations Contour Interval = 2 sigma N = 26



Equal-Area Schmidt Net Projection of Slickenlines, Down-Dip Mineral lineations and Poles to Brittle Fault Planes Squares: Slickenlines n = 21 Circles: Down-dip Mineral Lineations n = 13 Triangles: Poles to Brittle Fault Planes n = 18

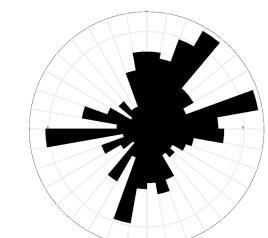


Unidirectional Rose Diagram of Joints Outer Circle = 6% Mean vector = 342 degrees



Unidirectional Rose Diagram of Spaced Cleavage N = 94Outer Circle = 12%

Mean vector = 205 degrees



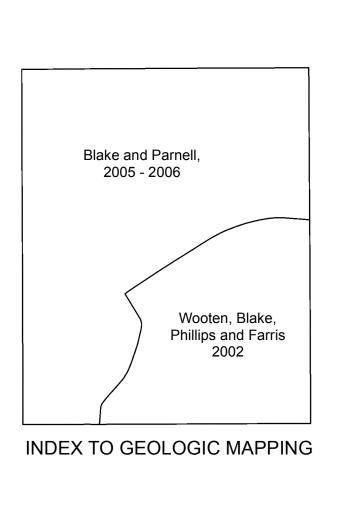
Unidirectional Rose Diagram of Fracture Surfaces N = 330

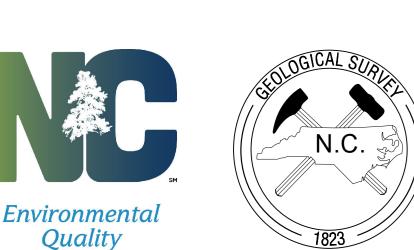
Outer Circle = 6%

Mean vector = 53 degrees

Satterwhite	Stovall	Townsville
Berea	Oxford	Henderson
Stem	Wilton	Kittrell

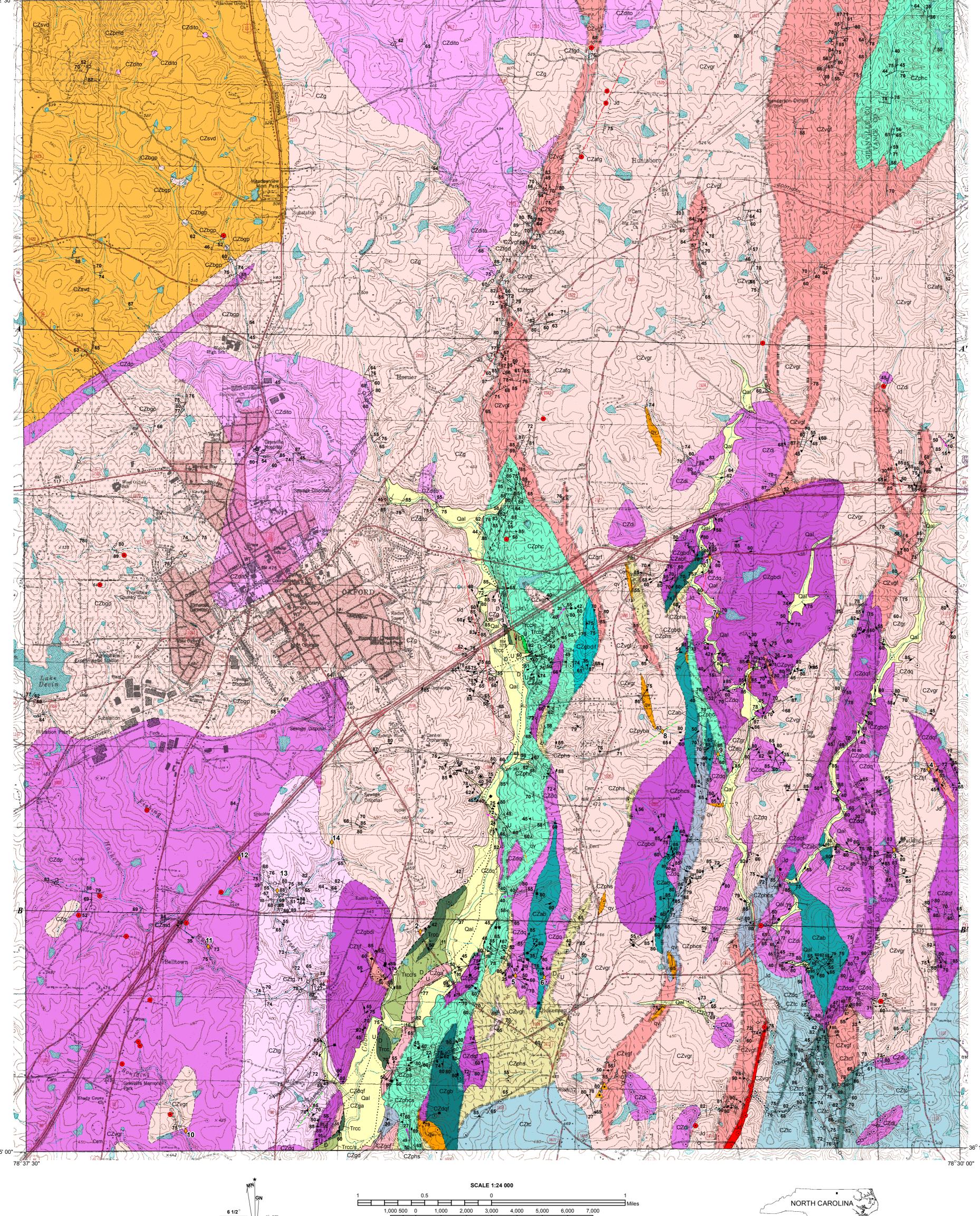
ADJOINING 7.5' QUADRANGLES





Research supported by the U.S. Geological Survey, National Cooperative Geologic Mapping Program under STATEMAP (Awards - 2001, 01HQAG0061; 2004, 04HQAG0059; 2005, 05HQAG0082) This map and explanatory information is submitted for publication with the understanding that the United States Government is authorized to reproduce and distribute reprints for governmental use. The views and conclusions contained in this document are those of the authors and should not be interpreted as necessarily representing the official policies, either express or implied, of the U.S. Government.

Total Fe as Fe2O3 LOI = percent weight loss on ignition

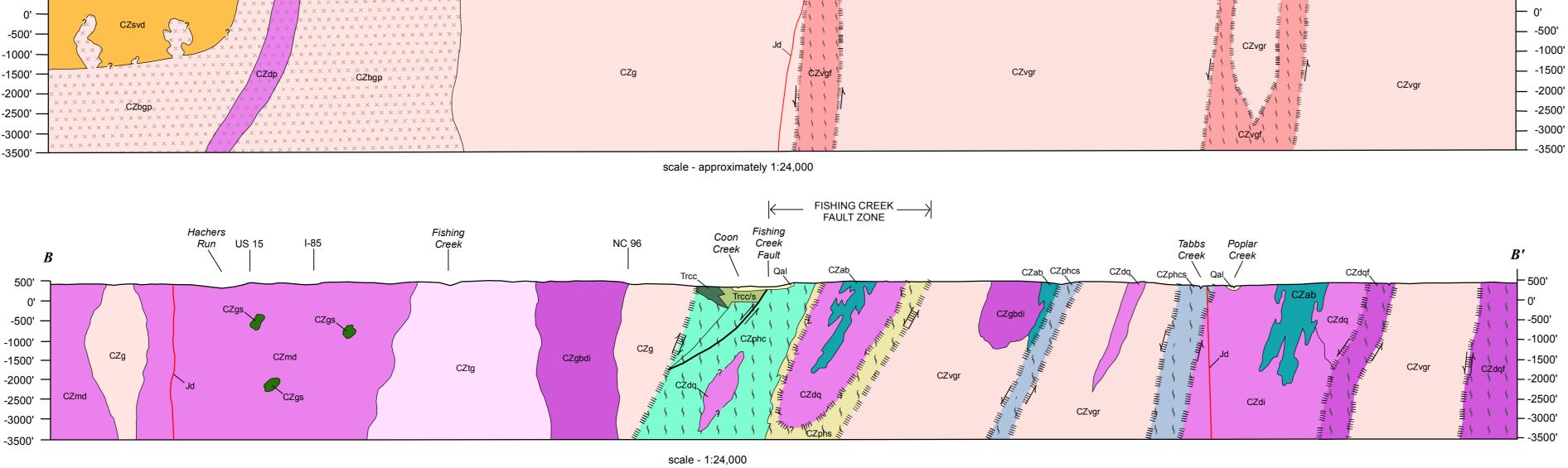


Base topographic monopole of the Oxford 7.5 m					110 UTM GR	GN G			1	1,000 500 0 1 1	0.5	SCALE 1:2 0 2,000 3,000 0 NTOUR INTERV	4,000 5	,000 6,000 1 1	7,000 Feet Kilometers	1 Miles	
Rock type	Map Unit		SiO2	TiO2	Al2O3	Fe2O3	MnO	MgO	CaO	Na2O	K2O	P2O5	Cr2O3	LOI	TOTAL	Ag	As
		UNITS	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%	%	%	ppm	ppm
		Det. Limits	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	1	

				4	(1001).			Ŭ ID AND 1981 MAC NATION AT CENT					со	NTOUR INTER	/AL 10 FEET							QUADRAN	IGLE LOCA	ΓΙΟΝ			
Map ID	Sample ID	Rock type	Map Unit		SiO2	TiO2	Al2O3	Fe2O3	MnO	MgO	CaO	Na2O	K2O	P2O5	Cr2O3	LOI	TOTAL	Ag	As	Au	Rb	Sr	Cu	Мо	Ta	Zn	Zr
				UNITS	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%	wt%	%	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
				Det. Limits	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	1		1	0.2	0.1	5	2	0.5		
1	OX-1	hornblende metadiorite	CZgbdi		51.05	1.94	18.73	8.93	0.17	3.03	7.13	4.72	0.89	0.63	< 0.01	2.05	99.39	<1		3	20.1	630	19	<2	1.1	 '	
1	OX-1 (DUP)	hornblende metadiorite	CZgbdi		50.9	1.94	18.73	8.94	0.17	3.03	7.15	4.74	0.89	0.63	< 0.01	2.05	99.28	<1		8	20	628	19	<2	1.1	 '	
2	OX-11	metagranite	CZg		76.39	0.2	12.97	1.56	< 0.01	0.15	0.22	4.1	4.08	0.02	0.02	0.75	100.6	<1		2	88.8	92.7	8	3	1.6	 '	
3	OX-303	biotite metagranite	CZvgr		72.26	0.29	14.36	2.45	0.05	0.64	1.93	4.4	3.27	0.08	0.02	0.65	100.5	<1		<1	87.8	225	9	<2	0.5	 '	
4	OX-313	metatrondjhemite	CZdqf		71.19	0.31	14.98	2.79	0.01	0.77	1.89	5.08	1.57	0.08	< 0.01	1.6	100.4	<1		5	43.6	301	68	4	< 0.5	 '	
5	OX-324	biotite quartz metadiorite			69.29	0.39	15.47	3.32	0.07	1.21	2.38	4.65	2.08	0.11	0.01	1.3	100.4	<1		<1	51.5	281	59	3	< 0.5	 '	
6	OX-328	qtz hornblende metadiorite			57.89	1.18	15.7	9.1	0.19	2.54	5.81	4.12	1.47	0.27	< 0.01	1.5	99.88	<1		<1	40.4	429	15	<2	< 0.5	 '	
7	OX-352	hornblende metagabbro	CZgbdi		47.71	2.49	16.88	12.2	0.27	4.04	8.3	4.34	0.42	0.95	< 0.01	1.75	99.47	<1		6	5.6	674	41	<2	1.1	 '	
8	OX-376	porphyritic meta-andesite			53.42	1.62	15.33	12.47	0.2	3.06	7.33	2.41	0.46	0.34	< 0.01	2.85	99.58	<1		5	12.7	459	117	<2	0.7	 '	
9	OX-379	chorite-sericite phyllitε	CZphc		56.33	1.3	15.94	10.47	0.12	2.91	4.87	4.03	0.8	0.38	< 0.01	2.55	99.82	<1		6	22.4	402	73	<2	< 0.5	 '	
10	OX05-6068A	greenstone	CZmd		53.00	1.12	15.4	11.2	0.18	4.7	8.62	3.18	0.88	0.19	0.01	1.55	100.1	<1	<1	<1	22.7		111	<2	<0.5	109	3.3
10	OX05-6068B	quartz metadiorite	CZmd		61.5	0.7	16.4	5.42	0.1	2.22	5.29	4.44	1.64	0.18	< 0.01	1.1	99.1	<1	<1	<1	35.4		26	<2	<0.5	63	1.2
11	OX05-6085	quartz metadiorite	CZmd		56.5	1.13	17.4	7.79	0.14	2.98	6.39	4.39	0.98	0.24	< 0.01	1.5	99.5	<1	<1	<1	19.1		63	<2	<0.5	57	1.7
12	OX05-6183	metadiorite	CZmd		55.3	0.8	17.6	7.52	0.11	4.11	7.79	4.04	0.8	0.21	< 0.01	1.15	99.5	<1	<1	<1	16.1		37	<2	<0.5	43	2.1
13	OX05-6196A	greenstone	CZtg		55.5	1.38	15.5	10.7	0.13	3.24	5.17	3.58	2.13	0.31	< 0.01	1.75	99.6	<1	<1	<1	57.4		98	<2	< 0.5	119	5.2
13	OX05-6196B	metagranodiorite	CZtg		69.7	0.35	15	2.75	0.06	1.13	3.04	4.48	2.32	0.1	< 0.01	1.05	100.1	<1	<1	<1	48.3		7	<2	< 0.5	33	7.7
14	OX05-6340	greenstone	CZg		49.4	1.63	16.3	10.3	0.26	5.44	8.06	3.15	2.67	0.35	0.01	1.35	98.9	<1	<1	<1	84.4		96	<2	< 0.5	133	7.1

Select data provided in table. Additional data available in spreadsheet format upon request. Geochemical analyses completed by SGS Minerals, Toronto, Canada for 11 major and trace elements. Whole-rock analyses used various methods as noted below. Sample series OX-1 to OX-379 analyzed by XRF103 and MS95. Sample series OX05 analyzed using method codes XRF76Z + 75V, IMS95A, and FAI303, and individual element method code ICMS12B for Ta.

Blank data cell indicates sample not analyzed for paramater



Creek

FISHING CREEK FAULT ZONE

Compiled Geologic Map of the Oxford 7.5-Minute Quadrangle, Granville and Vance Counties, North Carolina

David B. Parnell, David E. Blake, Richard M. Wooten, Cindy M. Phillips, and Paul F. Farris Digital representation by Michael A. Medina, Norman K. Gay, Cindy M. Phillips and Timothy W. Clark

2016

The pre-Mesozoic crystalline rocks of Oxford 7.5-minute Quadrangle are part of the Neoproterozoic Carolina terrane. These rocks are metamorphosed to the chlorite zone of the lower greenschist facies during Neoproterozoic and Paleozoic tectonothermal activity. Only Late Triassic sedimentary rocks and Jurassic diabase are not regionally metamorphosed, although contact metamorphic effects occur locally where diabase intrudes sedimentary rocks. While subjected to this low-grade regional metamorphism and locally displaying fracture, foliation, and lineation, most crystalline rocks preserve relict plutonic, volcanic, or volcanogenic sedimentary textures, which when combined with bulk rock compositions, allow for protolith identification. In some exposures, especially adjacent to the trace of the Fishing Creek Fault, highly partitioned strain produces either highly fractured, phyllonitic, or protomylonitic and mylonitic rocks of meta-igneous origin. Local outcrops of highly silicified, epidotized, and/or sericitized, or silicified-epidotized cataclasite rock have unclear protolith affinity. All sedimentary rocks of Mesozoic and Cenozoic age have a detrital origin involving clay- to gravel-sized sediment. The northern portion of the quadrangle was the subject of a masters thesis by Parnell (2012). Parnell (2012) information, unit descriptions and unit contacts were used to update the Parnell, et al. (2006) map.

The classification and naming of metaigneous rocks in the Oxford 7.5-minute Quadrangle uses the nomenclature of the International Union of Geological Sciences (IUGS) subcommission on the systematics of igneous rocks after Le Maitre (2002). Relict igneous textures, modal mineral assemblages, or normalized mineral assemblages when whole-rock geochemical data are available, provide the basis for naming metaigneous lithodemes. A preliminary lithodemic designation is developed here following Articles 31-42 of the North American Stratigraphic Code. These rock units, which lack in geochronologic data and stratigraphic facing directions, warrant such a designation.

Qal - Quaternary Alluvium: Tan, to yellow-brown and light brown unconsolidated, clay, silt and sand mixtures. Primarily sandy silt and silty sand but includes local gravelly horizons within flood

Trcc - Conglomerate and muddy sandstone of the Chatham Group Lithofacies Association III: Red brown, clast-supported, cobble and boulder conglomerate with subordinate sandy, gravelly conglomerate and muddy sandstone. Predominant lithic fragments are subangular to subrounded granitic and felsic intrusive rocks; matrix contains both mud and sand components.

Trcc/s - Conglomerate, sandstone, and mudstone of the Chatham Group Lithofacies Association III: Red brown, clast- to matrix-supported poorly sorted, gravel conglomerate, conglomeratic muddy sandstone, muddy sandstone, and subordinate mudstone.

Trcbr - Sandstone and mudstone breccia: Mottled red, yellow-brown, and light gray breccia and foliated breccia derived from Triassic sedimentary rocks. Hematite coatings on subparallel slip surfaces in mudstone and siltstone impart a foliated appearance; breccia consists primarily of angular sandstone fragments in a muddy matrix.

J Jd - diabase: Steeply dipping to sub-vertical dikes of dark gray to black, fine- to medium-grained diabase that may be olivine bearing. Crosscuts other meta-intrusive units. Solid lines where observed, dashed where inferred, and dotted where concealed. Red circles indicate areas of abundant float inferred to be near original location.

CAROLINA TERRANE

qv - vein quartz and quartz breccia: White to light gray, coarse-grained, highly fractured vein quartz and brecciated vein quartz. Typically associated with shear zones; locally contains sericite and/or chlorite phyllonite clasts. Down-dip slickenlines common on fracture planes. Locally contains/includes subhedral quartz crystals as vein infilling.

Metaintrusive and Metavolcanic Rocks

CZpyba - Porphyritic meta-andesite: Fine-grained dikes with 2-6 mm plagioclase phenocrysts (commonly altered to epidote) in a fine-grained dark green groundmass of quartz, chlorite,

epidote and hornblende. Chlorite also occurs replacing hornblende. Occur as thin (less than 10 m wide) dikes. CZdito - Metadiorite-meta-tonalite: Mesocratic to melanocratic (CI = 50-65) dark gray to green-black, phaneritic, diorite, quartz metadiorite, and hornblende-biotite metatonalite. Outcrops as medium to large boulder fields on hillsides and farm fields, but also in creek bottoms. Minor to accessory amounts of quartz are present in the diorite, while in the tonalite portions, quartz are typically gray up to 4 mm in length. Accessory magnetite associated with chloritized hornblende is common, and accessory potassium feldspar is locally present. Epidote group minerals commonly replace plagioclase and impart a pale green color in hand sample; chlorite typically replaces hornblende. Rare relict clinopyroxene present enclosed within hornblende. Generally unfoliated to weakly foliated; however, well developed foliations defined by chlorite are common in localized shear zones and contacts with other rock units. Typically includes enclaves of

grayish-green to green-black metabasalt and meta-andesite. Outcrop-scale crosscutting relationships indicate felsic lithodemes CZpbg, CZgr, and CZg are younger than unit.

CZgs - Greenstone: Green to green-grey, fine to medium grained, massive typically spheroidal boulders consisting of plagioclase, pyroxene, hornblende, epidote group minerals, and typically pyrite bearing. Generally unfoliated, commonly occurring as enclaves within CZmd. Present on cross section only.

CZmd - Medium grained metadiorite: Dark grey to green black, medium to locally fine grained hornblende plagioclase metadiorite. Epidote minerals commonly replace plagioclase imparting a pale green color in hand sample. Outcrops as large abundant boulders in creek beds.

CZdi - Metadiorite: Gray, white and black, medium- to coarse grained, mesocratic quartz, hornblende diorite. Chlorite replaces hornblende and combined comprises up to 40%. Locally

Plagioclase phenocrysts reaching 1 cm in length are contained in an aphanitic matrix, and have undergone extensive sausserite (epidote) and sericite reaction replacement commonly with the

contains blue-gray quartz in amounts less than 5%. Invades and includes enclaves and dikes of gray-green to green-black metabasalt and meta-andesite (CZab). CZdq - Quartz metadiorite: Light gray, white and black, fine- to medium-grained, mesocratic, +/- accessory hornblende, biotite, quartz metadiorite, subordinate metagranite (with subordinate

meta-granodiorite). Plagioclase partially replaced by sericite and epidote group minerals; chlorite replaces biotite and hornblende. Quartz comprises 5-25% of the rock, locally as light, blue-gray phenocrysts. Includes enclaves and dikes of gray-green to green-black metabasalt and meta-andesite (CZab).

CZdqf - Foliated equivalent of quartz metadiorite: Biotite, commonly replaced by chlorite, defines foliation surfaces along with sericite and flattened quartz and feldspar phenocrysts; S-C composite fabric common, as well as localized, very fine-grained siliceous mylonite. Includes zones of +/- chlorite, sericite, quartz phyllite and phyllonite. CZdp - Metadiorite Porphyry: Mesocratic to Melanocratic (CI=40-60) dark gray to black, porphyritic metadiorite: Contains plagioclase, hornblende, minor biotite, and opaque minerals.

phenocrysts core more extensively altered than the rims indicating normal zoning. Locally, phenocrysts of K-feldspar occur. This unit is intrusive into surrounding units. CZgbdi - Hornblende metagabbro-metadiorite: Dark gray to green-black, medium- to coarse-grained, hornblende plagioclase metagabbro and metadiorite. Minor to accessory amounts of quartz are present in the metadiorite. Accessory magnetite associated with chloritized hornblende is common, and secondary pink potassium feldspar is locally present. Epidote group minerals commonly replace plagioclase and impart a pale green color in hand sample; chlorite typically replaces hornblende. Relict clinopyroxene (augite?) is rarely present enclosed within hornblende. Generally unfoliated to weakly foliated; however, well-developed chlorite foliations are common in localized shear zones and contacts with other rock units. Typically includes enclaves of gray-

green to green-black meta-basalt metabasalt and meta-andesite (CZab). CZgbdif - Foliated equivalent of hornblende metadiorite-metagabbro: Chlorite defines foliation surfaces along with flattened and aligned hornblende and plagioclase phenocrysts. Includes

CZgb - Metagabbro: Black to gray-black melanocratic, fine- to medium-grained metagabbro. Relict pyroxene and metamorphic hornblende common; magnetite present in sufficient amounts to make the rock distinctly magnetic. Sheared varieties along the contact with the Fishing Creek fault zone include mylonite and blastomylonite with pink feldspar porphyroclasts; and, chlorite plagioclase phyllonite typically with composite S-C fabric.

CZvgr - Felsic meta-intrusive suite (Vance County pluton): Leucogranite, trondhjemite, granite, and granodiorite. Generally leucocratic ranging from pale pink to light gray, medium- to coarse-grained, typically with quartz phenocrysts in a felsic matrix. Sericite partly replaces perthitic microcline and sericite and epidote group minerals partly replace plagioclase. Biotite ranges from less than 10% to accessory amounts in leucocratic units; accessory magnetite locally present. Includes enclaves of gray-green to green-black metabasalt and meta-andesite (CZab). Generally unfoliated but includes localized foliated varieties, and sericite, quartz phyllite and phyllonite.

CZvgf - Foliated equivalent of felsic meta-intrusive suite (Vance County pluton): Includes pale green to light gray +/- chlorite, sericite quartz phyllite and phyllonite. Composite S-C fabric, and spaced cleavage common. Includes enclaves of greenstone consisting of gray-green to green-black metabasalt and meta-andesite (CZab).

CZpyg - Porphyritic metagranite: Pink potassium feldspar phenocrysts (2-8mm) and gray quartz phenocrysts in a medium-grained gray and white groundmass. Occur as dikes cross- cutting

CZafg - Alkali feldspar granite: Pinkish to orange medium to coarse grained alkali feldspar granite. Quartz phenocrysts 1-2 mm in size, appear bluish in hand sample, and pinkish orange potassium feldspar phenocrysts, 1-2 mm in size occur in a groundmass of nearly all potassium feldspar with minor quarts. Rock unit occurs as small undeformed intrusive bodies through out the

CZfgd – Foliated biotite granodiorite: Mesocratic (CI=35) green-black to pink, medium to coarsely crystalline, foliated biotite granodiorite. It crops out as small circular to ovoid shaped pods in the creek bottom of Coon Creek, some outcrops show only a weak incipient foliation; however along Coon Creek within the Fishing Creek Fault Zone, it becomes a protomylonite. Contains quartz, plagioclase, k-feldspar, chlorite, and minor opaque mineral clots. Chlorite and white mica locally define fracture and shear foliations as well as flattened plagioclase crystals. Chlorite encases rotated and asymmetrical plagioclase and quartz porphyroclasts that display wings of recrystallized quartz and plagioclase in protomylonitic rock types, while schistose rocks consist of mostly chlorite and display a composite S-C fabric foliation development.

CZgcf - Foliated Gibbs Creek pluton: Foliated and locally lineated equivalent of the metagranodiorite. Chlorite and white mica define a metamorphic overprint upon biotite, hornblende and feldspar, and are well developed in phyllonitic to mylonitic fracture and shear foliation zones. Less foliated rocks develop a sheen due to fine-grained, oriented white mica overprint of feldspar. Millimeter- to centimeter-scale relict feldspar phenocrysts define a porphyroclastic microstructure. Locally zones of silica and epidote that form silicified ridges overprint the foliated rocks, especially in its western portions. Description from adjacent Wilton quadrangle. Polygon added to edge-match with adjacent quadrangle.

CZtc - Tabbs Creek Meta-Igneous Suite: Variably green colored, fine- to medium-grained, variably fractured, greenstone to metagabbro and metadiorite. Crosscut by fine- to coarse-grained biotite hornblende quartz metadiorite to metagranodiorite, and locally metatrondhjemite to metagranite. Greenstone to metagabbro and metadiorite forms enclaves within more felsic rocks, or exhibit variably oriented dikes of more felsic rocks.

CZtcf - Foliated equivalent of Tabbs Creek Meta-Igneous Suite: Foliated equivalent of variably green colored, fine- to medium-grained, variably fractured, greenstone to metagabbro and metadiorite and crosscuting fine- to coarse-grained biotite hornblende quartz metadiorite to metagranodiorite, and locally metatrondhjemite to metagranite. Locally chlorite and white mica define spaced cleavage and shear foliations.

developed mylonitic varieties. Accessory pale green epidote and +5% pyrite are distinctive. CZgd – Metagranodiorite: Grayish-white, coarse-grained, unfoliated and locally fractured, leucocratic (CI less than 15), blue-gray quartz biotite +/- hornblende (?) metagranodiorite. Description

CZtjf - Metatrondhjemite: White to pale gray, fine-grained, foliated epidote, sericite, quartz, plagioclase rock. Differentiated quartzo-feldspathic and sericite laminae characterize locally

from adjacent Wilton quadrangle. Polygon added to edge-match with adjacent quadrangle. CZtg - Unfoliated biotite metatonalite and minor metagranodiorite: Variably green-grey to grey-white, medium to coarse grained biotite metatonalite, and metagranodiorite. Quartz is a

bluish to locally light grey, with plagioclase commonly showing alteration to epidote group minerals. CZg - Metagranite: Gray- medium pink or pink-orange, medium- to coarse-grained, biotite metagranite and quartz metamonzonite, +/- accessory hornblende; mainly equigranular but locally

porphyritic. Pink potassium feldspar distinctive; rose quartz common. Generally unfoliated, but a locally developed spaced cleavage with sericite films occurs in the vicinity of the Fishing Creek CZga - Altered equivalent of CZg: Pink and green, to pink and gray metagranite and quartz metamonzonite. Sericite partially replaces potassium feldspar; sericite and epidote partially;

replaces plagioclase; highly fractured and brecciated varieties with iron and manganese oxide fracture coatings occur in the vicinity the Fishing Creek fault. Thin chlorite and sericite films coating fracture planes define a fracture cleavage; Pink potassium feldspar and green chlorite is distinctive in foliated varieties along with composite S-C fabric. Greenstone occurs locally as enclaves consisting of green to green-grey, fine to medium grained, massive typically spheroidal boulders consisting of plagioclase, pyroxene, hornblende, epidote group minerals, and typically pyrite

CZbgp - Coarse-grained biotite metagranite porphyry: Tan to brown mesocratic to leucocratic, medium to coarse grained biotite metagranite porphyry. Bluish to grey quartz phenocrysts, 1-3mm in size are set in a matrix of plagioclase and pink potassium feldspar. Biotite occurs as small mafic clots.

CZsvd - Metadacite: Dark gray to nearly black, aphanitic metadacite. Outcrops as large to medium-sized, highly resistant boulders on hillsides and creek bottoms in the northwestern portion of the Oxford study area. This unit has a distinct, but faint sulfur odor when fresh surfaces are broken due to a high concentration of finely crystalline and disseminated sulfide minerals, most commonly pyrite in hand sample. Contains phenocrysts of grey quartz, and plagioclase with lesser amounts of mafic and opaque minerals. Crosscutting relationships recognized in outcrop show that CZpbg and CZdito locally intrude this unit.

corner of the field area, this unit contains enclaves of CZsvd. CZab - Meta-andesite and metabasalt: Fine-grained dark gray-green to black-green, melanocratic +/- quartz, chlorite, epidote, hornblende plagioclase rocks. Chlorite replaces hornblende, and epidote group minerals replace plagioclase. Accessory magnetite and quartz are common. Generally unfoliated; foliated varieties with aligned chlorite hornblende occur. "Boxworks" fabric defined by intersecting quartz-epidote veins is distinctive. Probably represent hypabyssal basalt and andesite intrusives, as well as very fine-grained equivalents of metadiorite and metagabbro

CZpmd - Porphyritic metadacite: White to tan aphanitic to porphyritic metadacite. Occurs as boulders on hillsides and hilltops across two distinctive, resistant topographic highs in the northwestern corner of the field area. Phenocrysts of gray quartz up to 7-9 mm are set in a finely crystalline felsic matrix. Locally, near the very top of the topographic highs in the northwest

units. Occurs commonly as enclaves within other intrusive rock units. Equivalent in part to the greenstone unit of Cook (1968), and mafic volcanic unit of Hadley (1974).

CZabf - Foliated equivalent of meta-andesite and metabasalt: Chlorite defines foliation surfaces and includes localized zones of +/- sericite, chlorite phyllite.

CZphc - Chlorite schist, phyllite and phyllonite: Light green-gray to dark green, phyllitic rocks derived primarily from sheared intermediate and mafic intrusive rocks (CZdq, CZdi, CZab and CZdigb); includes chlorite, sericite phyllinite; and phyllonite; and, sericite, quartzo-feldspathic mylonite. Mylonitic fabric locally developed as mm-scale differentiated micaceous and quartzofeldspathic laminae along with flattened and rotated polycrystalline quartz-plagioclase aggregates. Includes thin zones of foliated quartz metadiorite (CZdqf), hornblende metadiorite-metagabbro (CZgbdi) and metagabbro (CZgb). S-C composite fabric common, and highly fractured and brecciated varieties occur near the Fishing Creek fault.

CZphs - Sericite, quartz schist, phyllite and phyllonite: Light gray phyllitic rocks probably derived from sheared felsic intrusive rocks, and possibly felsic pyroclastic rocks. Mylonitic fabric locally developed as mm-scale differentiated micaceous and quartzo-feldspathic laminae along with flattened and rotated polycrystalline quartz-plagioclase aggregates. S-C composite fabric

CZphcs - Sericite, chlorite schist, phyllite, and phyllonite: Light gray-green phyllitic rocks probably derived from sheared intermediate intrusive rocks. Mylonitic fabric locally developed as mm-scale differentiated micaceous and quartzo-feldspathic laminae along with flattened and rotated polycrystalline quartz-plagioclase aggregates. S-C composite fabric common.

REFERENCES:

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

This map supersedes NCGS Open File Report

2006-01. Edits to map include correction of edgematch issues, additional data, and modified unit

interpretations from masters thesis of Parnell (2012).

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EXPLANATION OF MAP SYMBOLS

Contacts												
	contact - inferred	1001 1001 1001 1001	shear zone contact									
	contact - concealed	-× × × ×	qv "dike"	<u> </u>								
	brittle fault - inferred		CZpyba - porphyritic meta-andesite dike									
	brittle fault - concealed		diabase dike - inferred									
<u>A</u> <u>A</u>	cross section line		diabase dike - concealed									

For normal brittle faults, D indicates downthrown side, U indicates upthrown side. The tick mark indicates dip of fault plane. Zones of late brittle fracture and/or faulting; characterized by vuggy quartz and local brecciation indicated by dashed X lines. In cross section, fault displacement arrows show the inferred direction of the main, late stage ductile-brittle fault movement related to Mesozoic rifting.

Faults - Solid where location known, dashed where inferred, dotted where concealed.

Structural Symbols

Observation sites are centered on the strike bar or are at the intersection point of multiple symbols. ▶75 strike and dip of inclined foliation 76 strike and dip of spaced cleavage * - 72 strike and dip of igneous contact ▶_{70|} strike and dip of inclined foliation strike and dip of spaced cleavage * strike of vertical igneous contact ▶ 45 (multiple observations at one location) 65 (multiple observations at one location) - 37 strike and dip of bedding strike of vertical foliation strike of vertical spaced cleavage strike and dip of fold axial plane strike of vertical foliation strike of vertical spaced cleavage (multiple observations at one location) (multiple observations at one location) (multiple observations at one location) - 34 strike and dip of brittle fault > 78 strike and dip of shear or shear foliation ■ 62 strike and dip of joint ** ▶50| strike and dip of shear or shear foliation bearing and plunge of slickenline lineation ▶80 (multiple observations at one location) **■**65| strike and dip of joint ** **■**₅₅ (multiple observations at one location) bearing and plunge of fold axis strike of vertical shear or shear foliation strike of vertical joint ** bearing and plunge of mineral stretch lineation strike of vertical shear or shear foliation (multiple observations at one location) strike of vertical joint bearing and plunge of intersection lineation (multiple observations at one location) 82 strike and dip of inclined foliation within enclave horizontal joint quartz breccia strike of vertical mesoscale ductile fault strike and dip of fracture surface *** station location without structural data whole-rock geochemical data location with map I.D strike of vertical fracture surface **

> Special notes for symbols * Spaced Cleavage (Wooten)— Closely-spaced planar fracture surfaces typically with sericite and/or chlorite mineral growth. Locally with Fe-Mn

oxide coating. Distinct from joints and foliation.

with Fe-Mn oxide coating. *** Fracture Surface (Blake and Parnell) - Planar surfaces and fractures. Locally with Fe-Mn oxide coating. May include joints.

** Joints (Wooten) – Planar surfaces, locally